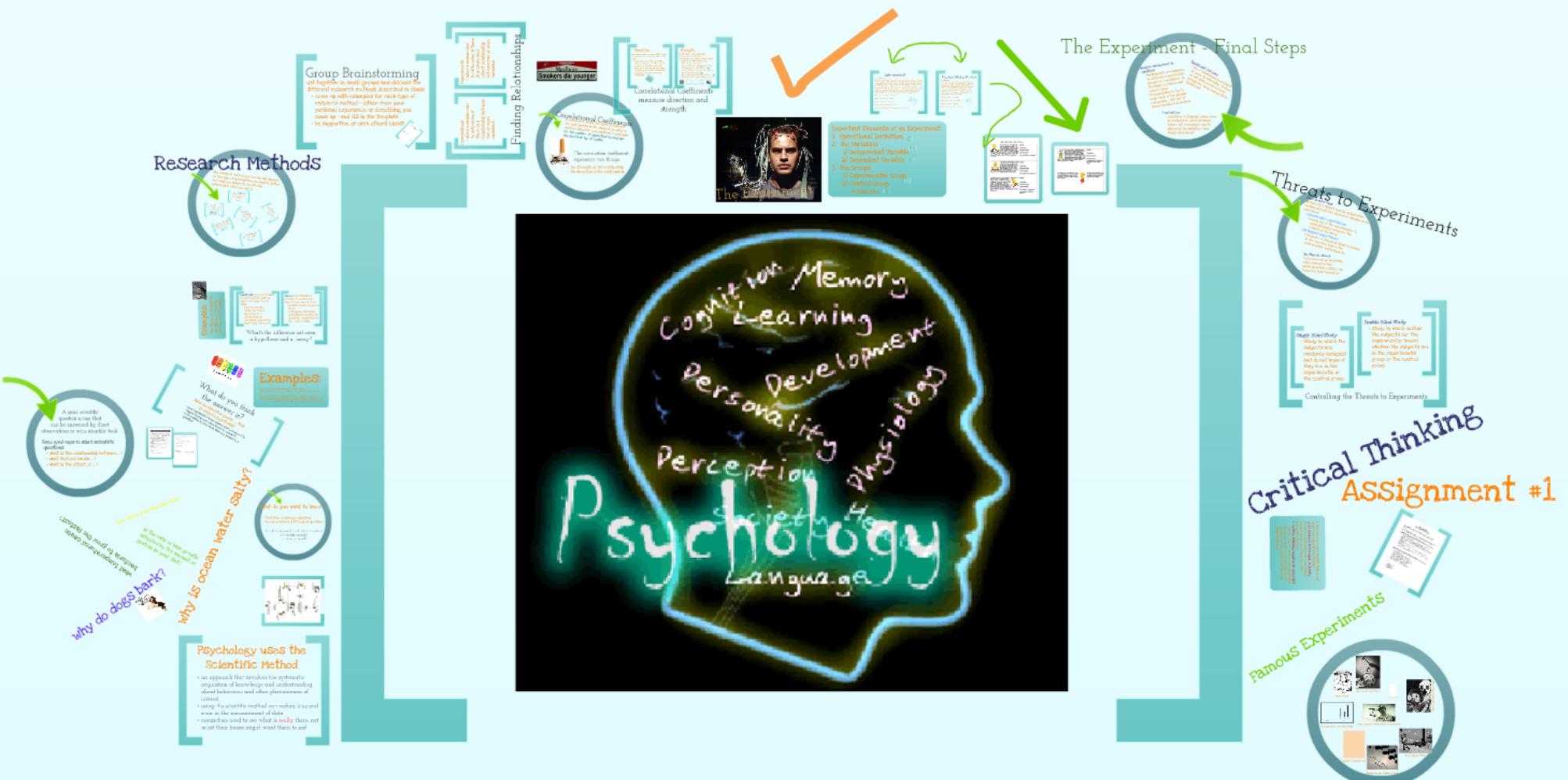
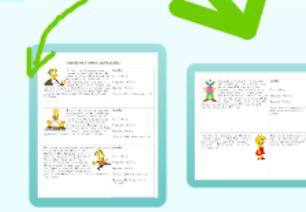
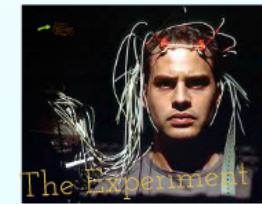


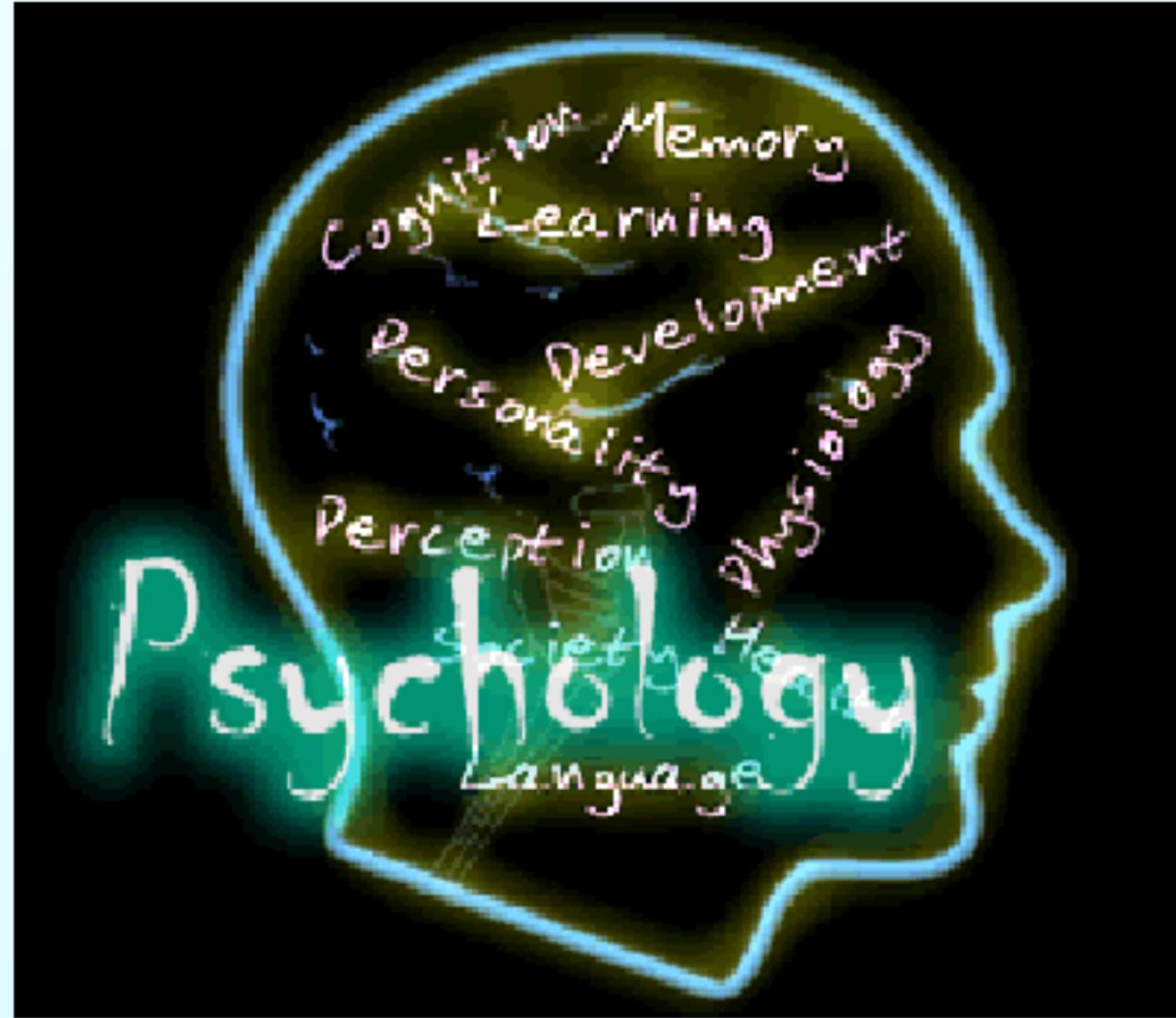
Psychology as a Science



and fill in the template
live of each others ideas!!



repetition of findings using other procedures in other settings before full confidence can be placed on the validity of any single experiment



Research Methods

A good scientist...
...uses the scientific method to make sure his/her results are reliable and can be replicated by other scientists. This is how we know that the results are accurate and not just a coincidence.

General Examples

What's the difference between a cognitive and a developmental approach?
What do you think the answers are to these questions?

Psychology uses the Scientific Method

- A scientific method is a systematic and objective way of gathering knowledge and understanding certain behaviors and other phenomena of interest.
- Using this method, scientists can have reliable and replicable results. This is important because if a scientist used his own words to describe these results, there would be more than one way to interpret them.

Threats to Experiments

Confounding Variables

1. The variables are manipulated.
2. The dependent variable is measured.
3. The groups are compared, in terms of control group + placebo.

Double-blind Study

In a double-blind study, both the researcher and the subjects are not informed about the treatment or placebo that the subjects are receiving. This is to make sure that the subjects are not influenced by the researcher's expectations or by the placebo effect.

Role of the Researcher

Role of the researcher is to make sure the subjects are not influenced by the researcher's expectations or by the placebo effect.

Controlling the Threats to Experiments

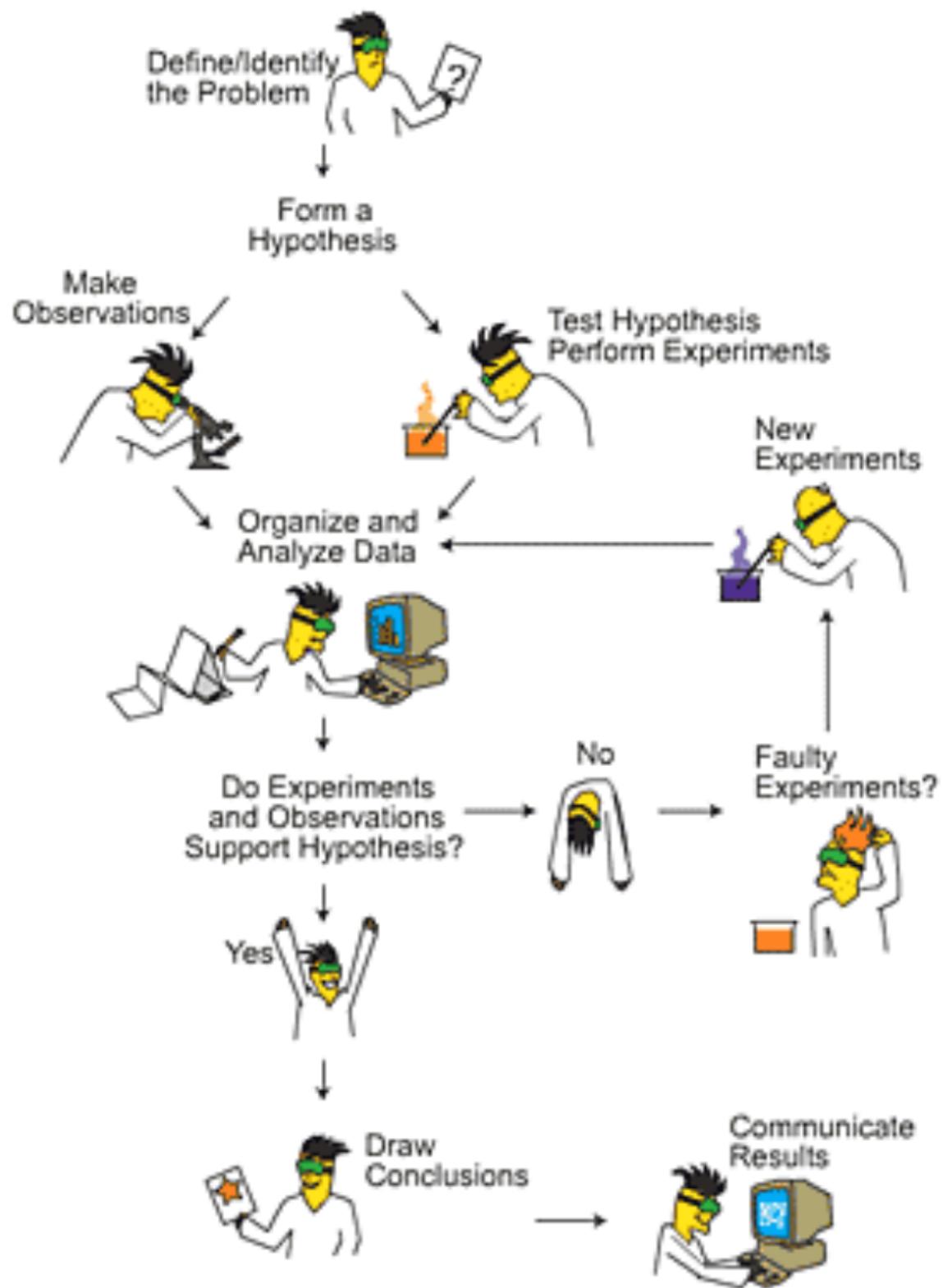
Critical Thinking Assignment #1

Famous Experiments

Psychology as a Science

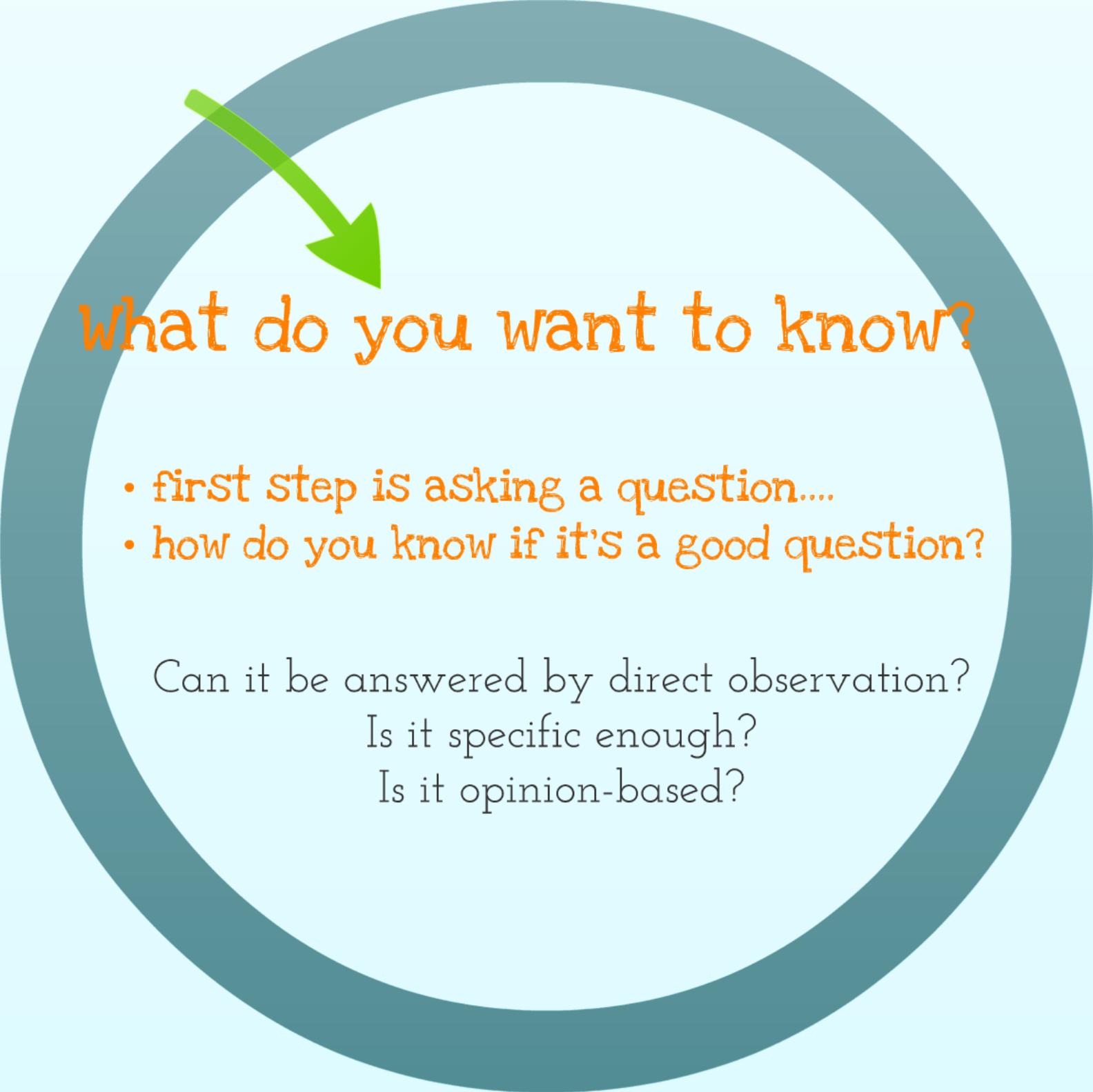
PSychology uSeS the Scientific Method

- an approach that involves the systematic acquisition of knowledge and understanding about behaviour and other phenomenon of interest
- using the scientific method can reduce bias and error in the measurement of data
- researchers need to see what is **really** there, not what their biases might want them to see!





What do you want to know?



- first step is asking a question....
- how do you know if it's a good question?

Can it be answered by direct observation?

Is it specific enough?

Is it opinion-based?

Psycholog
-tif

A

dogs bark?
back
what

why is ocean water salty?

is the rate of hair growth
affected by the amount of
protein in your diet?

the Sun rise?



what do you want to know
first step is asking a question
. first step is asking a question
. how do you know
Can it be answered by direct
Is it specific, because
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how often does the sun rise?

is the rain
affected
by the prot

is the rate of hair growth
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protein in your diet?



is affected
affected in your
protein in your

Why do dogs bark?

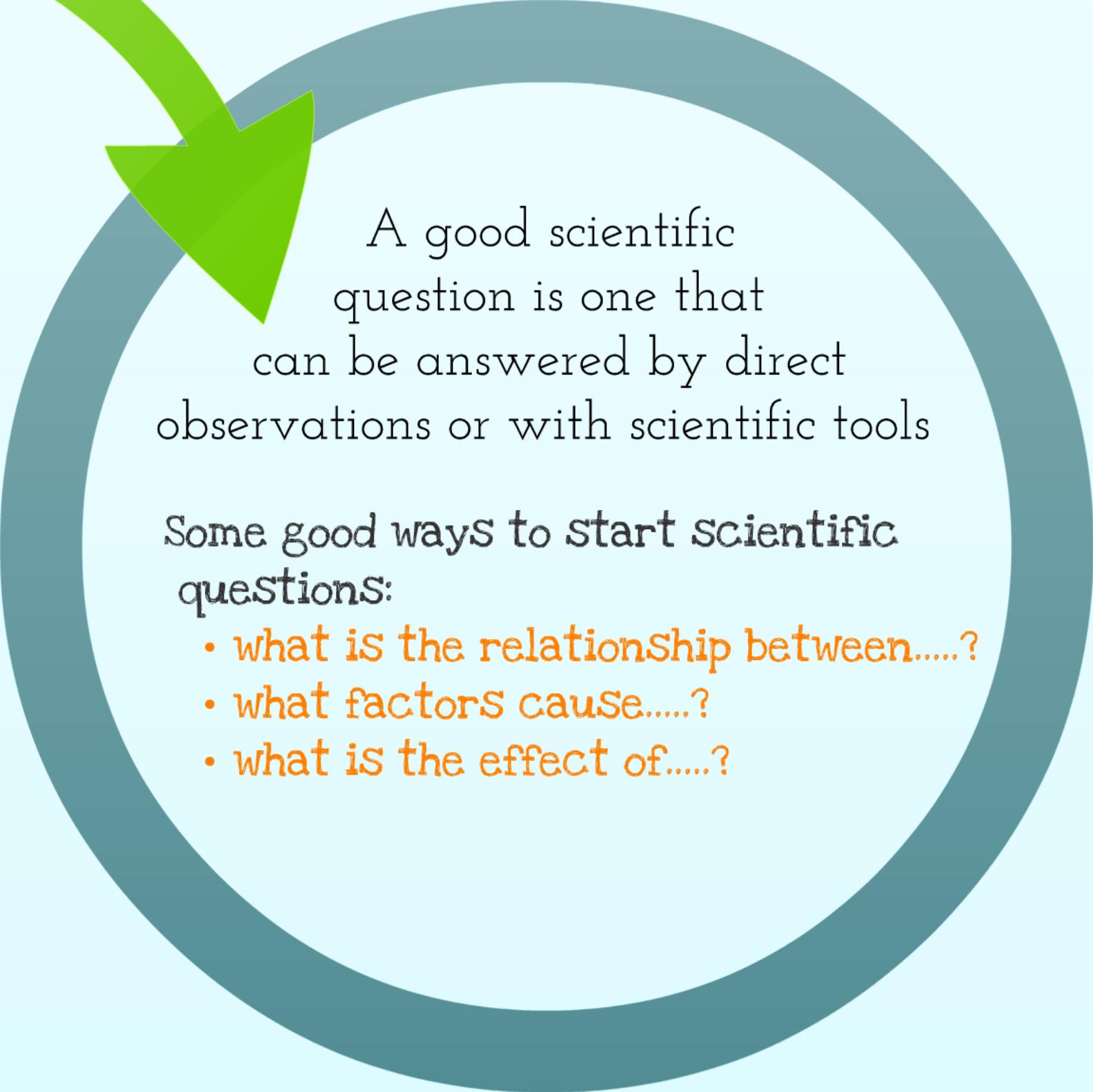


What temperature
bacteria to

why

what temperatures cause
bacteria to grow the fastest?

How
is the
protein in
affected by



A good scientific question is one that can be answered by direct observations or with scientific tools

Some good ways to start scientific questions:

- what is the relationship between....?
- what factors cause....?
- what is the effect of....?

Asking Good Scientific Questions

Questions are an essential part of science. What makes a good scientific question is that it can be answered by direct observations or with scientific tools. Examples of questions that are not scientific are based on values or opinions like what people believe is right or wrong, or beautiful or ugly.

Scientists may start with a broad question such as "Why do people get colds?" Next, they break the question down into smaller questions: Can you catch a cold from someone else? Is there a relationship between getting chills and catching a cold? They state the final question in a way that can be answered by investigation or experiment. A good scientific question is "Does getting chilled cause colds?"

Tips on Asking Good Scientific Questions

1. Begin by asking several questions about a topic.
2. Eliminate questions that cannot be answered by direct observation or by gathering evidence.
3. Break broad questions into smaller questions that can be investigated one at a time.
4. Word questions in a way that allows them to be answered by an experiment.
Here are some good ways to begin scientific questions: "What is the relationship between . . . ?" "What factors cause . . . ?" "What is the effect of . . . ?"

Directions:

1. Read each statement 1 – 10 below and write yes if the topic can be investigated scientifically. Write no if it cannot be investigated scientifically.
2. Then, for each item to which you answered yes, rewrite the topic on lines below each in the form of a scientific question.
3. Also answer Question 11 on the back of this sheet.

Statements 1 – 10:

1. Some people work better in the morning, and other people work better in the afternoon.

2. Taking something that belongs to another person is wrong.

3. Snakes travel in pairs.

4. Animals behave in strange ways before an earthquake.

5. People shouldn't use

6. Basketball is a better

7. You will remember b

8. Maria's bike is faster

9. Each year when the

10. Trucks use more gas

Think About It

11. Choose one of the statements above that you think would need to be investigated.

Next, they break the question
into parts and determine
a relationship between getting
the answer and the evidence
gathered during the investigation or
research.

gathered evidence.
at a time.

relationship between . . . ?" "What

ted scientifically. Write no if it
cannot be tested scientifically.
below each in the form of a

afternoon.

5. People shouldn't use things unless they can be recycled.

6. Basketball is a better sport than soccer.

7. You will remember best whatever you read just before you fall asleep.

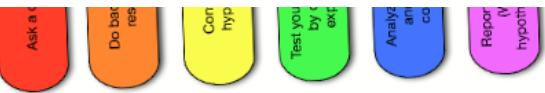
8. Maria's bike is faster than Rob's bike.

9. Each year when the weather gets cold, birds fly to warmer regions.

10. Trucks use more gasoline than cars.

Think About It

11. Choose one of the scientific questions you developed in 1-10 above and tell what kind of evidence you would need to answer the question. How do you think a researcher could collect that evidence?



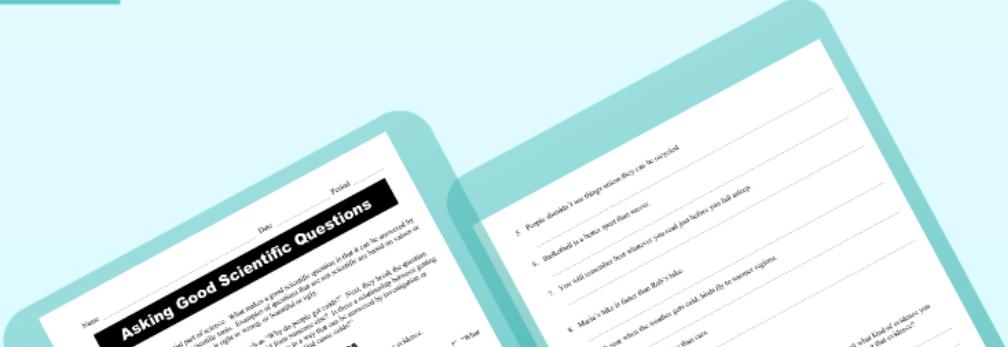
The Scientific Method

Question: Why do some people wash their hands more frequently than others?
 Hypothesis: People who wash their hands more frequently as people are more hygienic.

What do you think the answer is?

Make an educated guess.....this is called a hypothesis!

- your hypothesis should explain what you expect to happen during your experiment or research
- it is possible to have more than one answer to a question!



?

Examples:

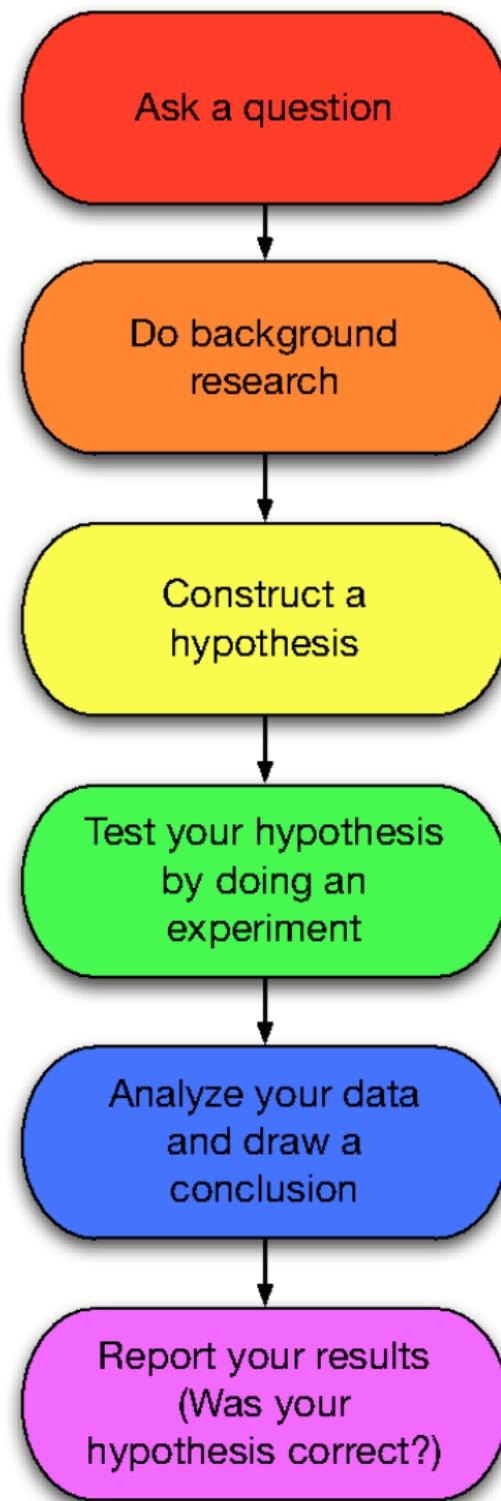
Question: Why do only some people get skin cancer?

Hypothesis: People who wear sunscreen reduce their risk of cancer

Question: Why do some people get sick a lot, while others do not?

Hypothesis: People who wash their hands regularly do not get sick as frequently as people who do not regularly wash their hands

The Scientific Method



Hypothesis: Specific, testable prediction about what you expect to happen in your study

- makes a specific prediction about a specified set of circumstances
- Speculative guess that hasn't been tested yet

Theory: well established principle to explain some aspect of the natural world

- predicts events in general terms
- extensively tested and generally accepted by the scientific community and the world at large

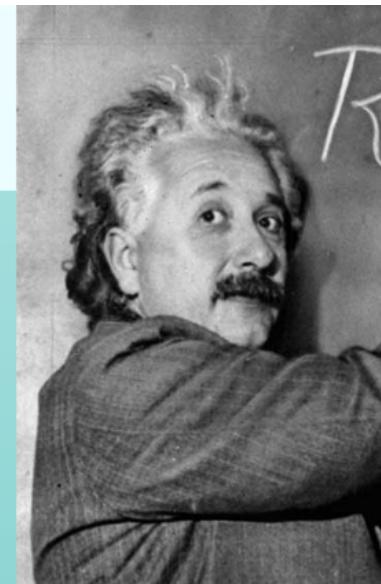
What's the difference between a hypothesis and a theory?

Examples:

The Theory of Relativity

The Theory of Gravity

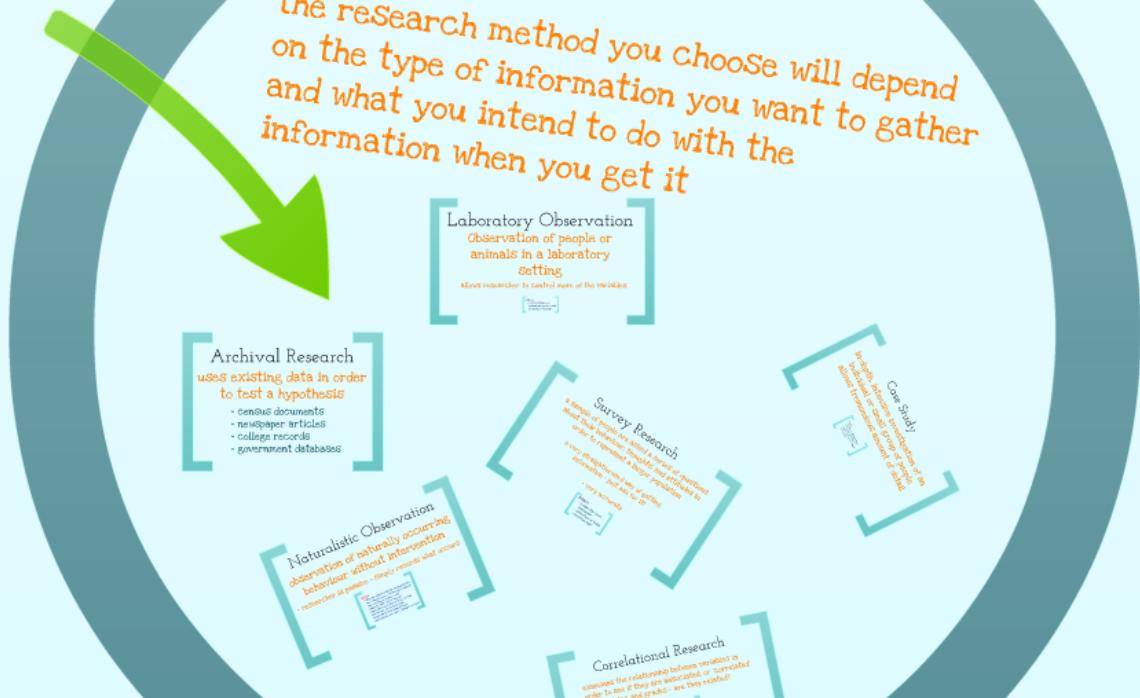
The Theory of Evolution



- different research methods
- Come up with a hypothesis
 - Research methods
 - personal
 - made up
 - be supported

Research Methods

the research method you choose will depend on the type of information you want to gather and what you intend to do with the information when you get it



Research Methods

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Archival Research
uses existing data in order
to test a hypothesis

Laboratory Observation
Observation of people or
animals in a laboratory
setting
allows researcher to control more of the variables

Survey Research
a sample of people are
asked questions in a
random order

Case Study
in-depth, intensive investigation of
an individual or small group of people
allows tremendous amount of detail

Archival Research

uses existing data in order
to test a hypothesis

- census documents
- newspaper articles
- college records
- government databases

Naturalistic Observation

observation of naturally occurring behaviour without intervention

- researcher is passive - Simply records what occurs

Pitfalls:

- Observer Effect: animals and people who know they're being watched don't behave the way they normally would
- Observer Bias: researcher has expectations of what behaviours they want to see and so they make observations that support their expectations and ignore things that don't

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animals in a laboratory
setting

allows researcher to control more of the variables

Pitfalls:

- artificial behaviour -
animals and people react
differently in the lab

Pitfalls:

- artificial behaviour - animals and people react differently in the lab

Survey Research

a sample of people are asked a series of questions about their behaviour, thoughts, and attitudes in order to represent a larger population

a very straightforward way of getting information - just ask for it!

- very accurate

Pitfalls:

- people have poor memories!
- distortion of truth
- courtesy bias

Pitfalls:

- people have poor memories!
- distortion of truth
- Courtesy bias

Case Study

in-depth, intensive investigation of an individual or small group of people allows tremendous amount of detail

Pitfalls:

- people and situations are not always predictable enough to apply the results to everyone

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- people and situations are not always predictable enough to apply the results to everyone

Correlational Research

examines the relationship between variables in order to see if they are associated, or 'correlated'
e.g. studying and grades - are they related?

Pitfalls:

- Correlation does not mean causation
- inability to demonstrate cause-and-effect relationships

Pitfalls:

- correlation does not mean causation
- inability to demonstrate cause-and-effect relationships

Group Brainstorming

Get together in small groups and discuss the different research methods described in class

- Come up with examples for each type of research method - either from your personal experience or something you made up - and fill in the template
- be supportive of each other's ideas!!



Types of Psychological Research

Type of Research:	Example:
Case Study	
Correlational Research	
Archival Research	
Naturalistic Observation	
Survey Research	

Correlations:

- allow a researcher to determine if there is a relationship between two or more variables

Experiments:

- allow a researcher to determine if there is a cause-and-effect relationship between two or more variables

Finding Relationships

Correlational Coefficients

a researcher needs two sets of numbers for each person in the study to produce a number called the **correlational coefficient** (i.e. the number of cigarettes smoked per day and their age at death)



The correlation coefficient represents two things:

- The **strength of the relationship**
- The **direction of the relationship**

the Correlational Coefficient
the number of cigarettes smoked per
and their age at death)

The correlation coefficient
represents two things:

- The strength of the relationship
- The direction of the relationship

Direction....

knowing the value of one variable allows researchers to predict the value of the other:

- if you know how many cigarettes Someone Smoked every day, you can predict how long they might live
- does life expectancy go up or down as smoking increases? This is what is meant by the direction of the relationship



Strength....

the strength of the relationship between the variables will be determined by the actual number itself

- the number will always range between +1.00 and -1.00
- a correlation of +.89 would be a very strong positive correlation
- a correlation of -.89 would be equally strong but negative
- the closer the number is to zero, the weaker the relationship becomes



Correlational Coefficients

measure direction and strength

Direction....

knowing the value of one variable allows researchers to predict the value of the other:

- if you know how many cigarettes someone smoked every day, you can predict how long they might live
- does life expectancy go up or down as smoking increases? This is what is meant by the direction of the relationship



Direction

- if the CC is positive, the variables increase in the same direction - if one goes up, so does the other; if one goes down, so does the other
- if the CC is negative, the variables have an inverse relationship: as one increases, the other decreases and vice versa

WHAT IS CORRELATION?

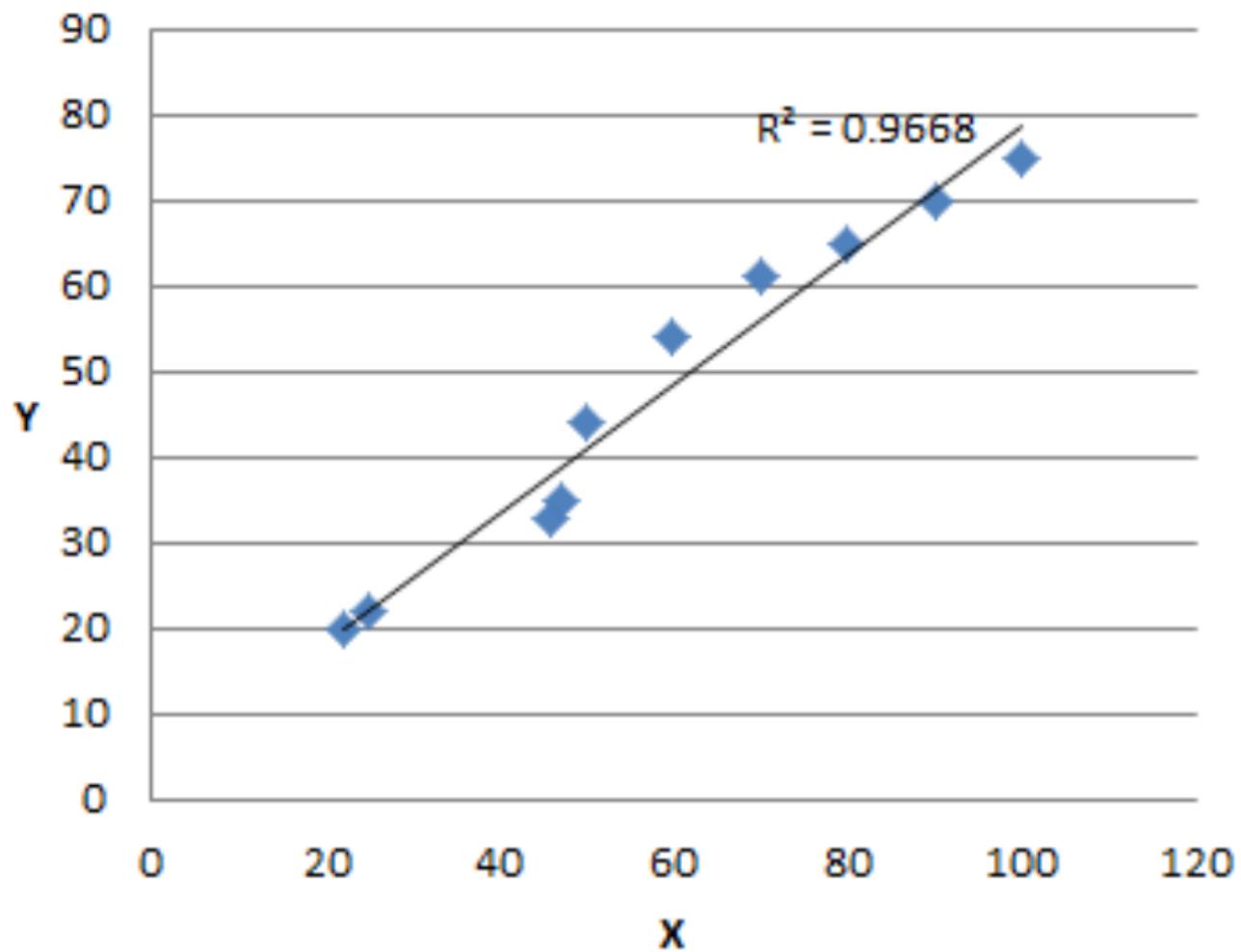
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Strong positive correlation:
like the relationship you might
find between the scores on an
intelligence test and your GPA
- as one number goes up so
would the other

Positive Correlation

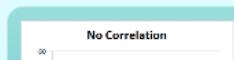


Perfect Positive Correlation (i.e. +1.00)

WHAT IS CORRELATION?

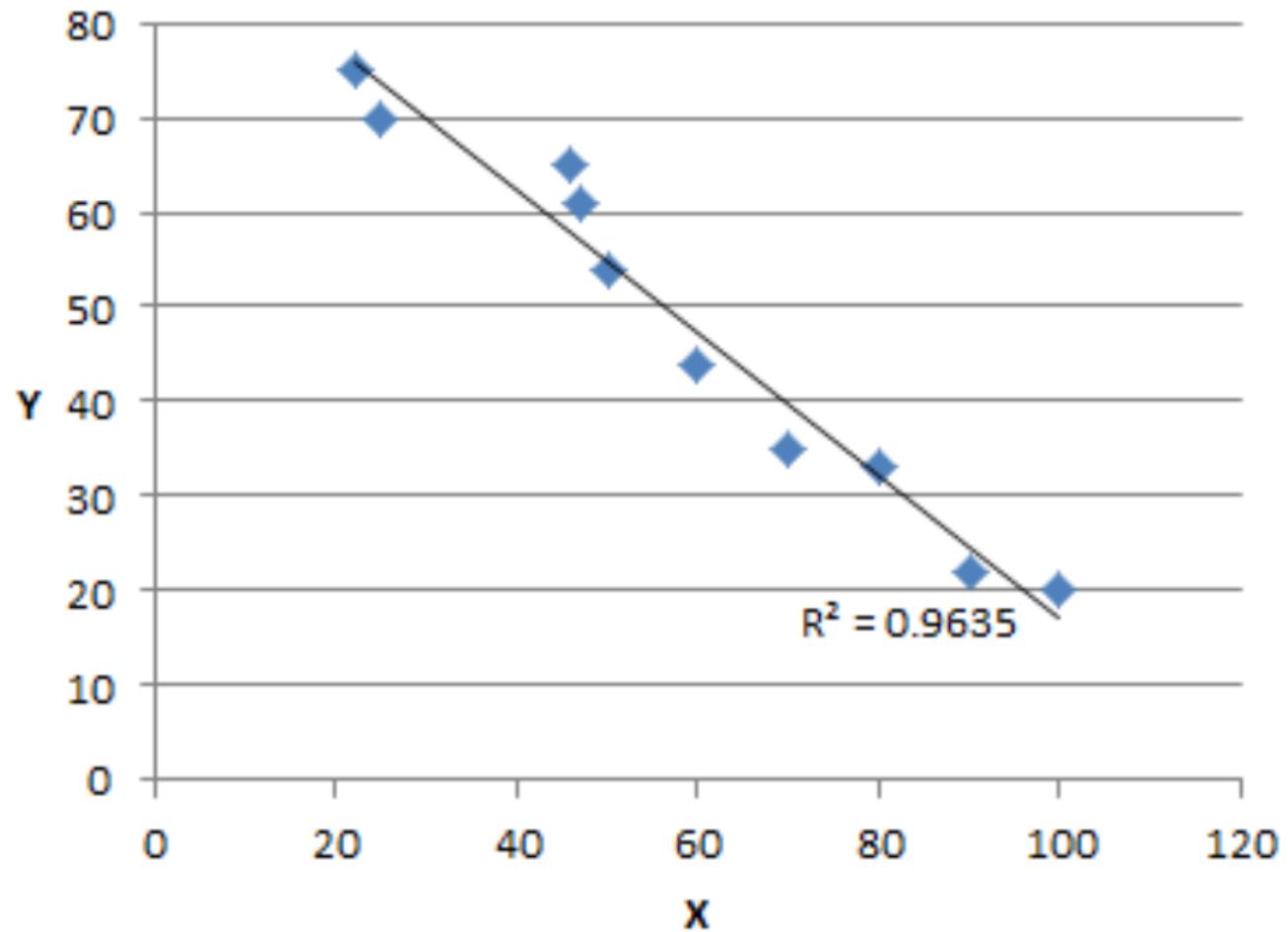
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- a correlation of -.89 would be equally strong but negative
- the closer the number is to zero, the weaker the relationship becomes



Strong negative correlation:
like the relationship
researchers would probably
find between smoking
cigarettes and the age at
which a person dies - as one
goes up the other would
likely go down

Negative Correlation

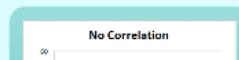


Perfect Negative Correlation (i.e. -1.00)

WHAT IS CORRELATION?

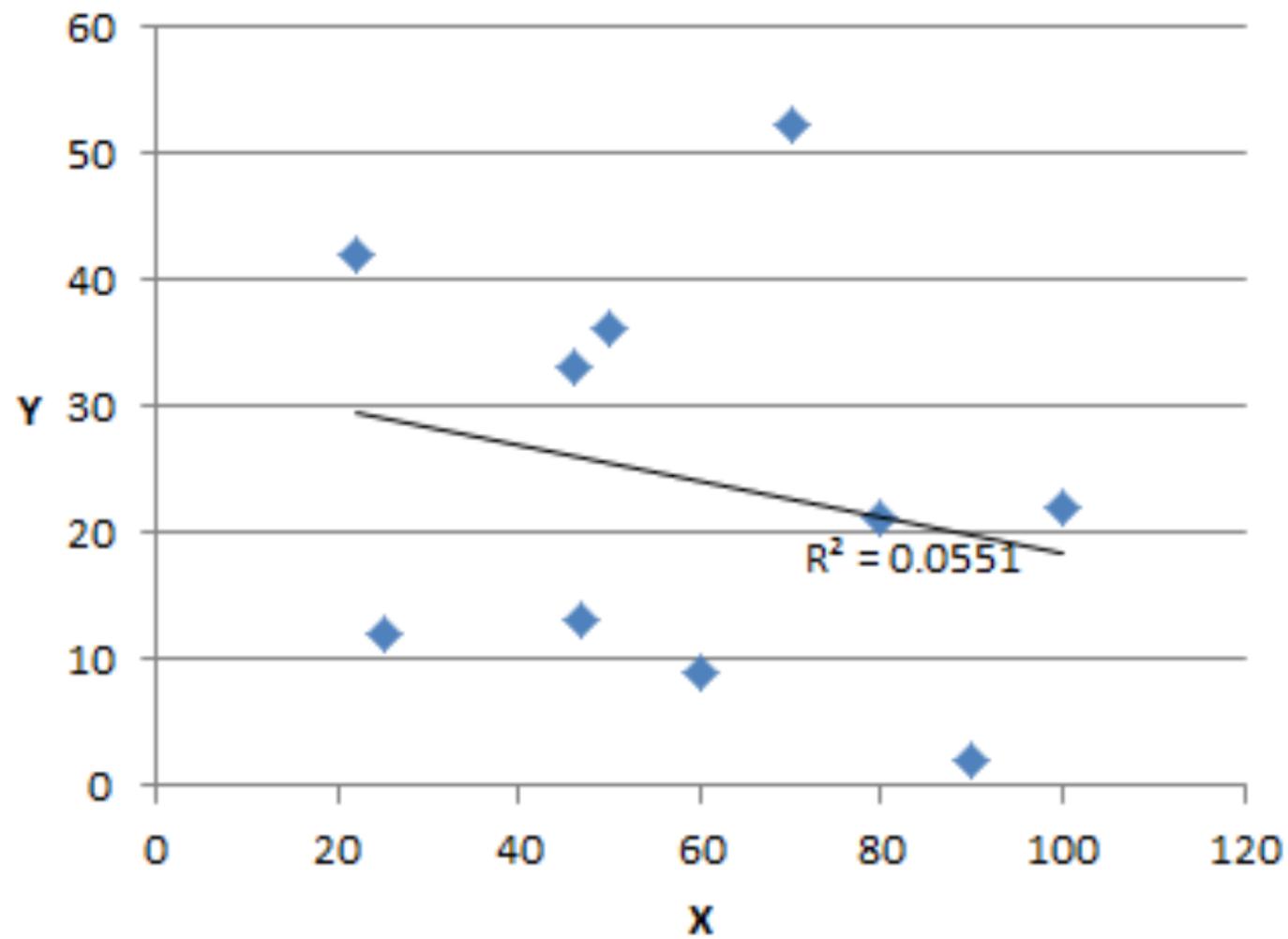
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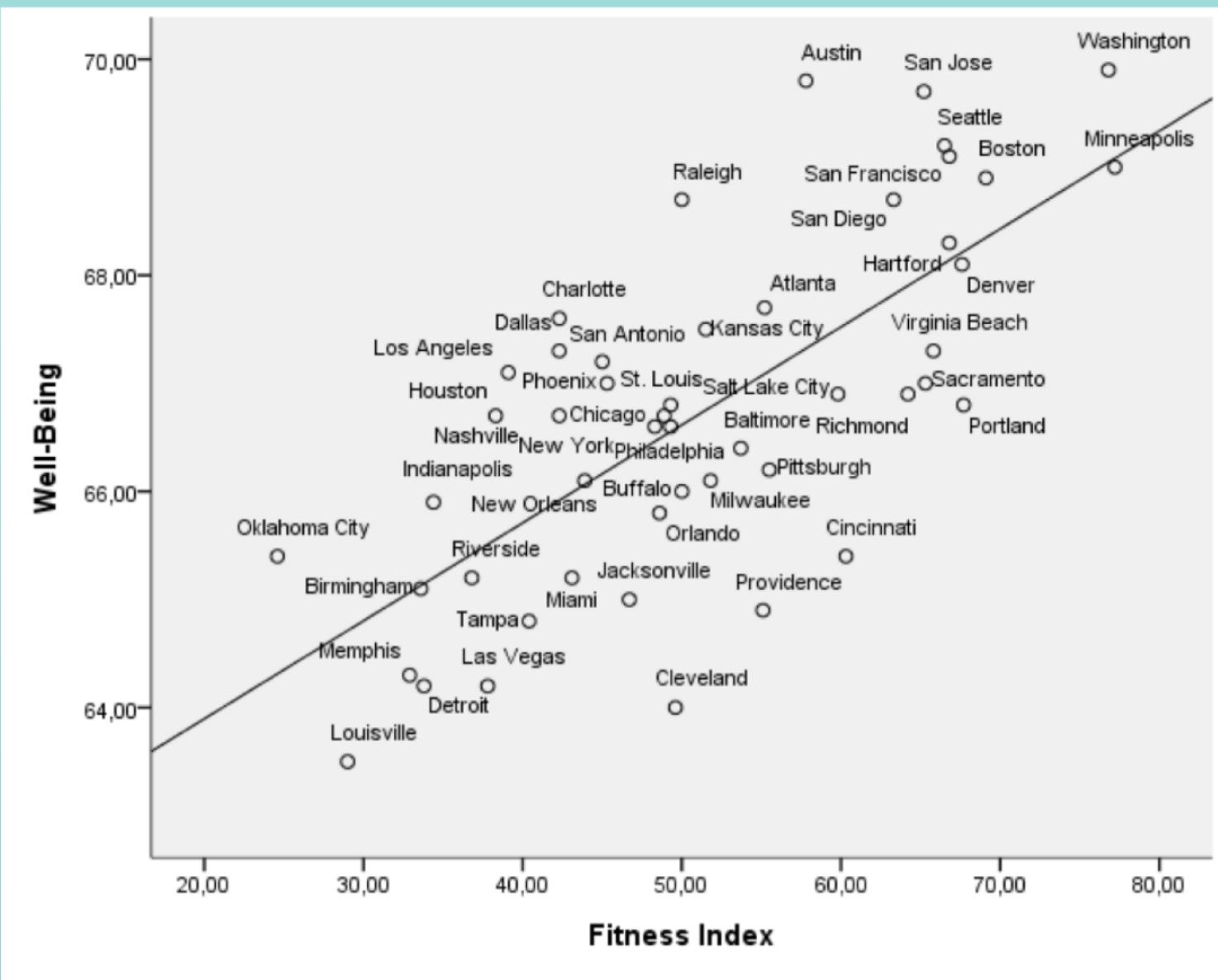


Numbers close to zero:
the correlation coefficient
for the relationship between
people's weight and the
number of freckles they have
would be pretty close to zero

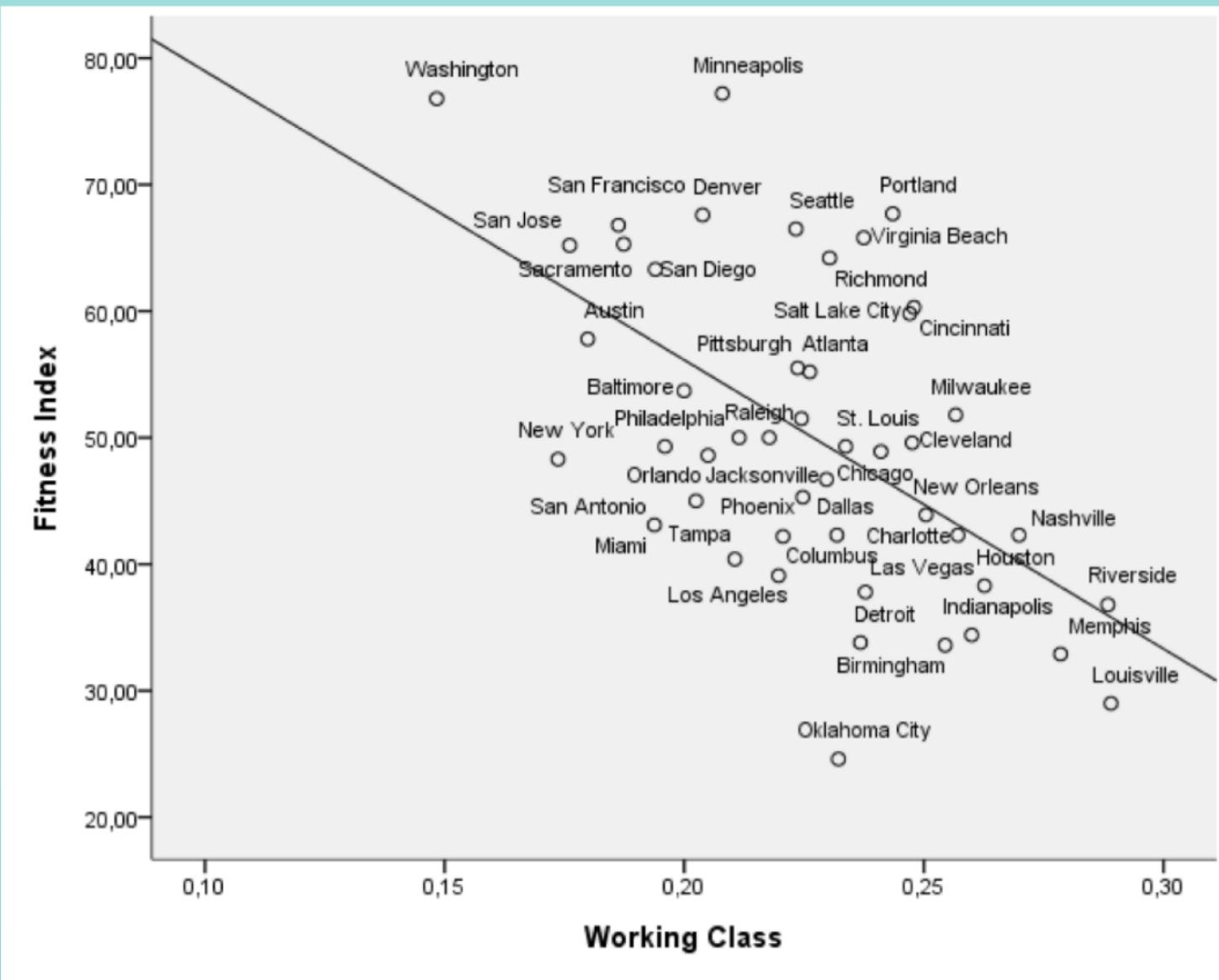
No Correlation



No Correlation at all (i.e. 0)



Modest Positive Correlation (i.e. +.5)



Modest Negative Correlation (i.e. - .5)



The Experiment:
The relationship between two variables is investigated by deliberately manipulating one variable in a situation while observing the effects it has on other aspects of the situation
- experiments allow for a determination of cause-and-effect relationships

The Experiment

The Experiment:

The relationship between two variables is investigated by deliberately manipulating one variable in a situation and observing the effects of that change on other aspects of the situation

- experiments allow for a determination of cause-and-effect relationships

Important Elements of an Experiment:

1. Operational Definition



2. The Variables

i) Independent Variable



ii) Dependent Variable



3. The Groups

i) Experimental Group



ii) Control Group

★ placebo



Operational Definition

- Specifically names all the steps or procedures that the experimenter must use to control or measure the variables in the experiment
- i.e. if the experimenter wants to measure the effects of watching aggressive TV shows on the behaviour of children, he would develop a checklist of specific actions that classify as aggressive behaviour so that it can be measured exactly - nothing is left up to chance!

Independent Variable:
The variable that is deliberately manipulated by the researcher in any experiment

- So called because it is independent of anything the participants might do
- Sometimes referred to as the 'treatment'

Dependent Variable:
The response of the participant to the manipulation of the independent variable

- This is always the thing that is measured to see how the independent variable might have affected it

The Variables

Identifying Variables - Practice

Question: What type of surface material best reduces friction on a skateboard wheel?

- _____ the type of surface the skateboard is on
- _____ the distance the skateboard travels

The Groups

Experimental Group:
Subjects in an experiment who are subjected to the independent variable

- this is the group that gets the 'treatment'

Control Group:
Subjects in an experiment who are not subjected to the independent variable and who may receive a 'placebo' treatment instead

- this group is used for comparison purposes
- they either receive no 'treatment' at all or they may receive a fake 'treatment'

What is a Placebo?

A fake treatment - a Sugar pill containing no medication or a Sham treatment given to the control group

A Sugar pill given to a patient in order to give them the expectation that they will get well

In controlled clinical trials, one group may be given a real medication or treatment, while another group is given a placebo

The purpose of using the placebo is to discern if the observed effects are actually due to the treatment

Lets practice!

1 - Patty Power

Mr. Krabbs wants to make Bikini Bottoms a nicer place to live. He has created a new sauce that he thinks will reduce the production of body gas associated with eating crabby patties from the Krusty Krab. He recruits 100 customers with a history of gas problems. He has 50 of them (Group A) eat crabby patties with the new sauce. The other 50 (Group B) eat crabby patties with sauce that looks just like new sauce but is really just mixture of mayonnaise and food coloring. Both groups were told that they were getting the sauce that would reduce gas production. Two hours after eating the crabby patties, 30 customers in group A reported having fewer gas problems and 8 customers in group B reported having fewer gas problems.

Which people are in the control group?

What is the independent variable?

What is the dependent variable?

What should Mr. Krabs' conclusion be?

Why do you think 8 people in group B reported feeling better?



Answers

1 - Patty Power

which people are in the control group? Group B

what is the independent variable? New Sauce

what is the dependent variable? Amount of gas

what should Mr. Krabs' conclusion be? The new Sauce appears to work as it reduced the amount of gas produced in 60% of the people tested.

Why do you think 10 people in group B reported feeling better? They thought they were getting the new Sauce as a result thought that they didn't have as much gas. (Placebo Effect)

Practice Makes Perfect!

2 - Slimotosis

Sponge Bob notices that his pal Gary is suffering from slimotosis, which occurs when the shell develops a nasty slime and gives off a horrible odor. His friend Patrick tells him that rubbing seaweed on the shell is the perfect cure, while Sandy says that drinking Dr. Kelp will be a better cure. Sponge Bob decides to test this cure by rubbing Gary with seaweed for 1 week and having him drink Dr. Kelp. After a week of treatment, the slime is gone and Gary's shell smells better.

What was the initial observation?



What is the independent variable?

What is the dependent variable?

What should Sponge Bob's conclusion be?

Answers

2 - Slimotosis

What was the initial observation? Slimotosis on Gary's Shell

What is the independent variable? Cures (Seaweed and Dr. Kelp)

What is the dependent variable? Slime and odor

What should Sponge Bob's conclusion be? Although Gary's symptoms have disappeared, it is not known which cure was the one that worked. He should redo the experiment and include a control group as well as two other testing groups for each of the proposed cures.

Identify the Controls and Variables



Smithers thinks that a special juice will increase the productivity of workers. He creates two groups of 50 workers each and assigns each group the same task (in this case, they're supposed to staple a set of papers). Group A is given the special juice to drink while they work. Group B is not given the special juice. After an hour, Smithers counts how many stacks of papers each group has made. Group A made 1,587 stacks, Group B made 2,113 stacks.



Homer notices that his shower is covered in a strange green slime. His friend Barney tells him that coconut juice will get rid of the green slime. Homer decides to check this out by spraying half of the shower with coconut juice. He sprays the other half of the shower with water. After 3 days of "treatment" there is no change in the appearance of the green slime on either side of the shower.



Bart believes that mice exposed to radio waves will become extra strong (maybe he's been reading too much Radioactive Man). He decides to perform this experiment by placing 10 mice near a radio for 5 hours. He compared these 10 mice to another 10 mice that had not been exposed. His test consisted of a heavy block of wood that blocked the mouse food. He found that 8 out of 10 of the radio-waved mice were able to push the block away and 7 out of 10 of the other mice were able to do the same.

Identify:

Control Group

Independent Variable

Dependent Variable

What should Smithers' conclusion be?

Identify:

Control Group

Independent Variable

Dependent Variable

What should Homer's conclusion be?

Identify:

Control Group

Independent Variable

Dependent Variable

What should Bart's conclusion be?

How could Bart's experiment be improved?



Krusty was told that a certain itching powder was the newest best thing on the market, it even claims to cause 50% longer lasting itches. Interested in this product, he buys the itching powder and compares it to his usual product. One test subject (A) is sprinkled with the original itching powder, and another test subject (B) was sprinkled with the Experimental itching powder. Subject A reported having itches for 30 minutes. Subject B reported to have itches for 45 minutes.

Identify:

Control Group

Independent Variable

Dependent Variable

Explain whether the data supports the advertisements claims about its product.

Lisa is working on a science project. Her task is to answer the question: "Does Rogooti (which is a commercial hair product) affect the speed of hair growth". Her family is willing to volunteer for the experiment.



Describe how Lisa would perform this experiment. Identify the control group, and the independent and dependent variables in your description.

The Experiment - Final Steps

- 
- Random Assignment to Condition:
- Participants are assigned to different experimental groups or "conditions" on the basis of chance and chance alone
 - it's impossible to try to make each of the groups comparable - the list of characteristics is endless
- Significant Outcome:
- Use of statistical procedures in order to determine whether or not differences between groups are large enough to be significant
- Replication:
- repetition of findings using other procedures in other settings before full confidence can be placed on the validity of any single experiment

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Significant
• Use a
in order
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Threats to Experiments

Experimental Bias:

Factors that distort how the independent variable affects the dependent variable in an experiment

- Experimenter expectations
 - ★ tendency of the experimenter to unintentionally influence the results of the study
- Participant expectations
 - ★ tendency of the participant to behave in the way they believe the experimenter wants them to

The Placebo Effect:

A phenomenon in which the expectations of the participants in a study can influence their behaviour

COOL STUFF

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 - ★ tendency of the participant to behave in the way they believe the experimenter wants them to

Experimenters believe the
participants wants them to

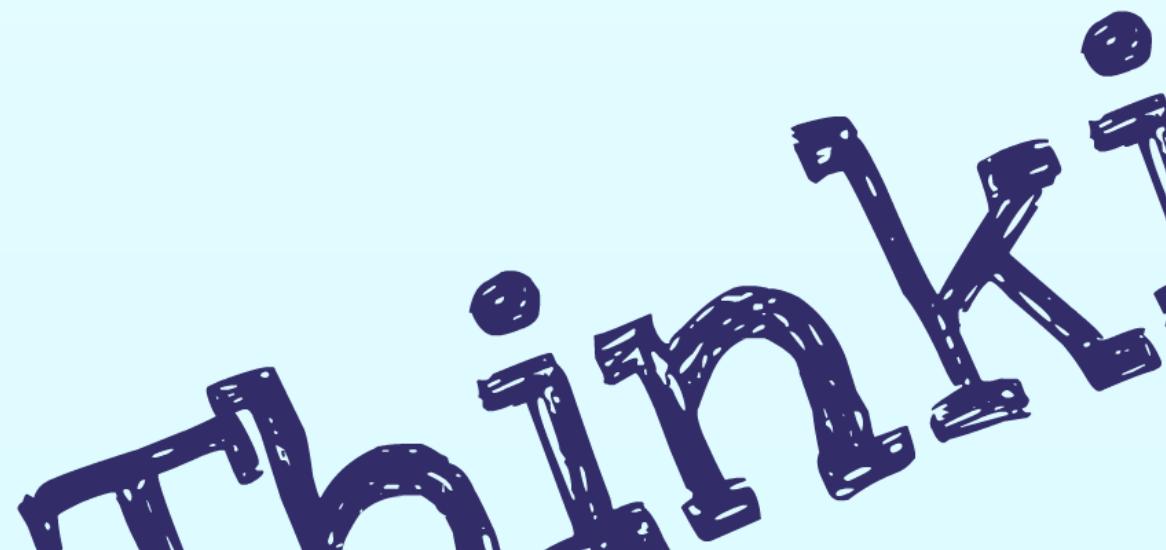
The Placebo Effect:

A phenomenon in which the
expectations of the
participants in a study can
influence their behaviour

- Study in which the Subjects are randomly assigned and do not know if they are in the experimental or the control group

• experimenter knows whether the Subjects are in the experimental group or the control group

Controlling the Threats to Experiments



Single Blind Study:

- study in which the Subjects are randomly assigned and do not know if they are in the experimental or the Control group

Double Blind Study:

- Study in which neither the Subjects nor the experimenter knows whether the Subjects are in the experimental group or the control group

Critical Thinking Assignment

1. There need to be very few
 2. All evidence subjected to truths doesn't because is not testing that do not automatically make someone equal in
 3. Just because is not testing that do not automatically make someone equal in
 4. Critically everything is in quality
- Michael thinking true
 - the Michael thinking they say
 - leaving Moore requires leaving truth - is he is theory? events possible preventing that don't fit

Controlling the Threats to Experiments

Study:
In which neither
the subjects nor the
experimenter knows
whether the subjects are
in the experimental
group or the control
group

Assigned
and do not know if
they are in the
experimental or
the control group

1. There are very few 'truths' that do not need to be subjected to testing
2. All evidence is not equal in quality
3. Just because someone is an expert doesn't make everything they say automatically true
4. Critical thinking requires an open mind
 - Michael Moore - is he really presenting the whole truth? Is it possible he is leaving out the events that don't fit into his theory?

Formal Lab Report

Psychology Core Concepts

The main purpose of this assignment is to encourage you to examine some historically important psychological research and what impact that research had on the field of psychology.

Pick an example of psychological research that sounds interesting to you. Read about it online and write a lab report about the experiment that researchers did to prove their hypothesis.

The body of your report should include the following section headings:

- Title and Name of Researcher(s)
- Purpose (What did the research study? Why did they choose this area or topic?)
- Hypothesis (What was the stated hypothesis or research question?)
- Experimental Design – list the independent, dependent, and controlled variables in the experiment, identify the experimental group and the control group and summarize the procedure
- Procedure (How did they conduct the study?)
- Observations
- Conclusions (What were the results? Was their hypothesis supported? Research question answered?)
- Why is this significant? (What relevance does the study have for the field of Psychology? How did this influence other research?)

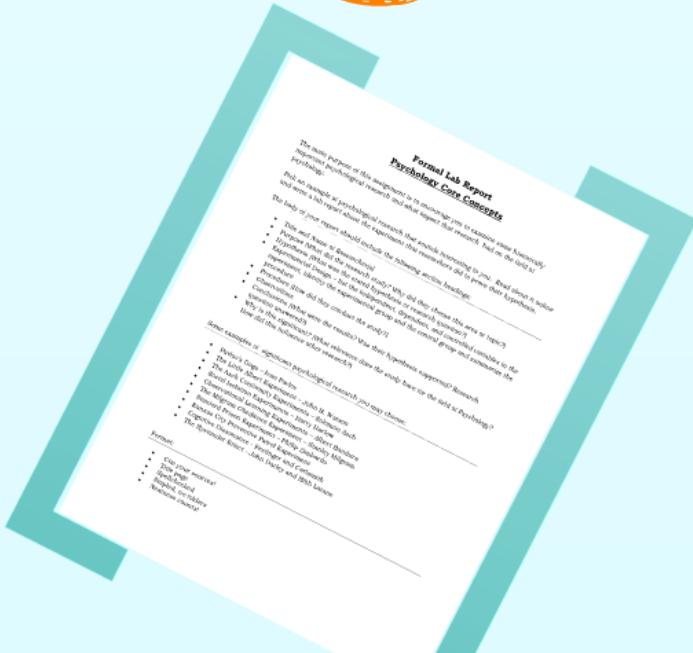
Some examples of significant psychological research you may choose:

- Pavlov's Dogs – Ivan Pavlov
- The Little Albert Experiment – John B. Watson
- The Asch Conformity Experiments – Solomon Asch
- Social Isolation Experiments – Harry Harlow
- Observational Learning Experiments – Albert Bandura
- The Milgram Obedience Experiment – Stanley Milgram
- Stanford Prison Experiment – Philip Zimbardo
- Kansas City Preventive Patrol Experiment
- Cognitive Dissonance - Festinger and Carlsmith
- The Bystander Effect - John Darley and Bibb Latane

Format:

- Cite your sources!
- Title page
- Spellchecked
- Stapled, no folders
- Neatness counts!

critical thinking Assignment #1



Famous Experiments



LONDON'S TIMES

by Nick Greenan

Illustrated by Richard Larson



Pavlov's Dogs

Little

ON'S TIMES

Illustrated by Richard Larson



Little Albert Experiment





Exhibit 1

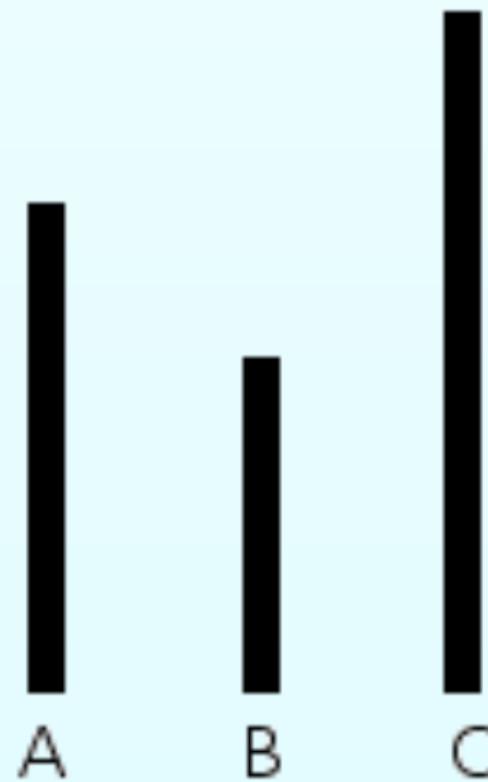


Exhibit 2

Solomon Asch Conformity Study



Albert Bandura - Bobo



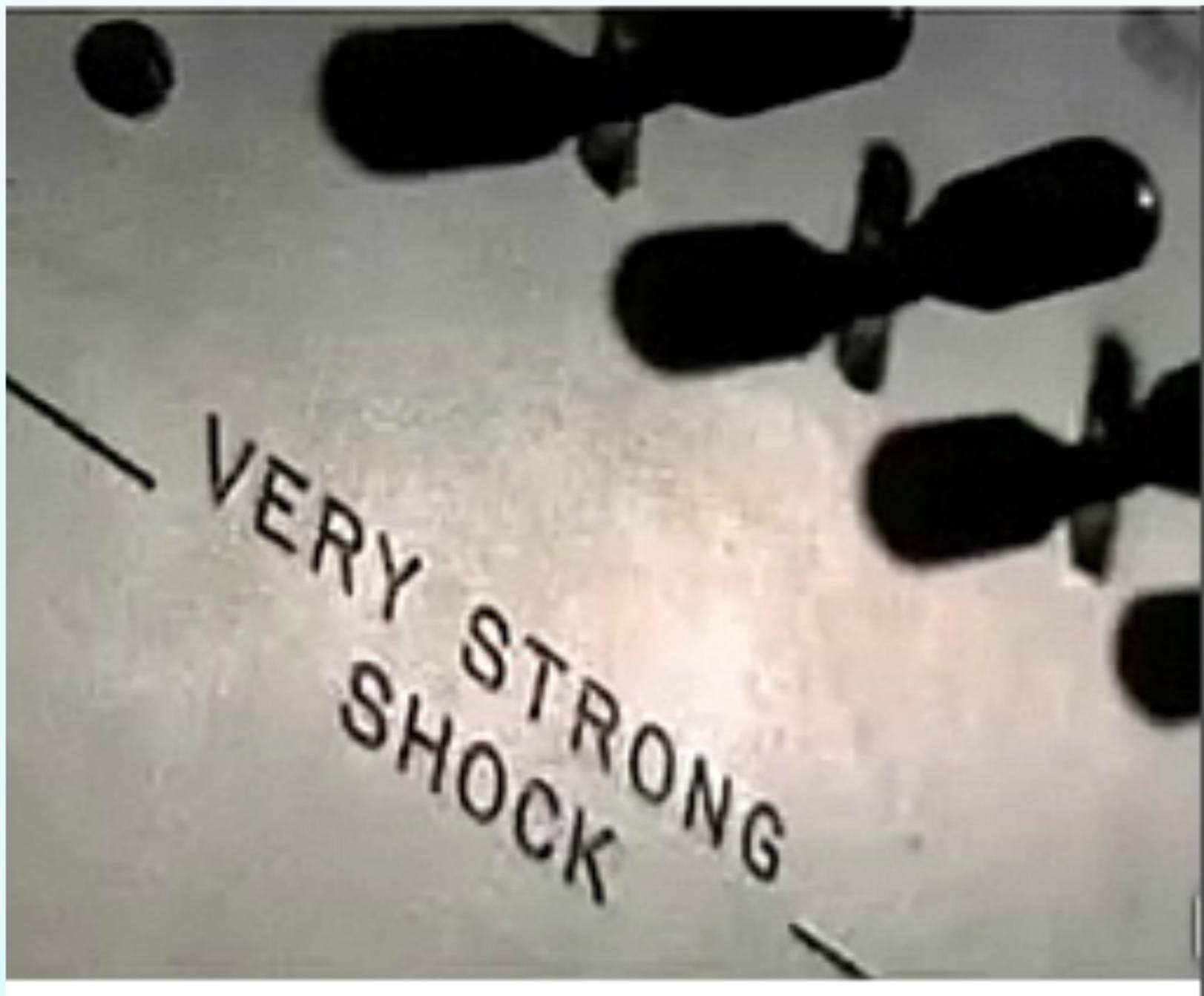
"Ach! The grapes are probably sour anyway!"

Cognitive Dissonance



Philip Zimbardo Stanford Prison Experiment

nce



Stanley Milgram Obedience Study



The ByStander Effect





bo
Harry Harlow's Monkeys