Issue 1

The Daily Dose

Your daily measure of science news reporting

Variables: Issue 1 takes a look at the variables used in research

Science Barometer: Your guide to what's hot and what's not

SCIENCE IN THE NEWS

In the United Kingdom, the majority of people still use news media (e.g. online and print) as their main source of up-to-date science information. Despite being an effective way to get information about science and the latest findings to a large number of people, many news articles contain inaccuracies.

Have you ever read a news article that has made you think "What on Earth are they talking about?" or "That doesn't sound right"?

Some headlines may raise a sceptical eyebrow straight away e.g. "*Eating your dead relatives' brains will prevent you from getting Alzheimer's*". Others, however, are more difficult to judge on the headlines alone e.g. "*Six coffees a day can cut the risk of MS*".

It is important to approach the information we read online and in print with healthy scepticism. Thanks to social media sites such as Twitter and Facebook, our roles have changed from consumers of news stories to both consumers and distributors of information online.

When you read something in the news and share it with your friends and family, how do you know whether the information is accurate or potentially damaging?

We hope that the Daily Dose will be a helpful guide throughout your psychology course and beyond. With your knowledge of research methods and a little help from the Daily Dose, you will:

1. Learn more about the principles of research and the application of research methods.
2. Apply your knowledge to everyday news stories and evaluate the news more critically.

Before long, you will find yourself questioning or even correcting information you read in the news.

SIX COFFEES A DAY LINKED

TO LOW RISK OF MS

Those who drink six cups of coffee a day could cut their risk of developing Multiple Sclerosis (MS), research suggests.

Research, published today, which included nearly 7,000 people from Sweden and the US found that a person's risk of developing MS was 30 per cent lower if they drank more than 900ml of coffee a day.

The risk of MS was higher among those who drank fewer cups of coffee even after other factors were taken into account.

Both studies gave participants questionnaires containing questions about their health, diets and lifestyles. Participants recorded the amount of coffee they drank on a daily basis and information about their MS risk.

The Swedish study found that those who drank more than 900ml every day had approximately 30 per cent lower risk of developing MS compared to non-coffee drinkers. The US study also reported similar findings.

The scientists noted that they are unsure as to why drinking a lot of coffee may protect against MS but they suspect that caffeine may play a role.

What is MS?

Multiple Sclerosis (MS) is the most common disabling neurological condition, with 50 sufferers in Britain diagnosed each week.

It's characterised by loss of mobility, sight problems, tiredness and excruciating pain.

Exercise 1: Six coffees a day linked to low risk of MS

Read the news article "*Six coffees a day linked to low risk of MS*" and answer the following questions:

1. How did the scientists collect information from their participants?

   Questionnaires

2. What information did the scientists collect from their participants?

   Information about their health, diets and lifestyles. The scientists were mainly interested how much coffee the participants drank in on a daily basis and information about their MS risk.

3. Who had the lowest risk of developing MS?

   Participants who drank more than 900ml of coffee a day.

VARIETY IS THE SPICE OF LIFE

In his 1785 poem "The Task", William Cowper penned the infamous phrase "*Variety is the spice of life, That gives it all its flavour".* Whilst variety is great for everyday excitement, scientists must sift through variability and make sense of the many variables we encounter. In this issue of the Daily Dose, we will explore the world of variables in research.

Most research starts as a question, e.g. "*Does social media worsen depression?"; "Do murderers have brain abnormalities?"; "Does the way we ask a question change eye-witness testimony?"* The type of question we ask determines the study designs and variables we can use to help answer our question.

The easiest way to begin to understand variables is by grouping them according to the study design they belong to. There are two main types of study designs: observational and experimental.

Experimental studies have independent and dependent variables. Scientists manipulate (make changes to) the *independent variable* and measure the *dependent variable* to see whether it *depends* on what they have changed.

In observational studies, scientists do not manipulate the variables. Instead, they look for the correlations (relationships) between two or more variables. These are referred to as *co-variables*. A helpful way to remember this is: **CO**-variables are for **CO**rrelations.

Once we have the question, we need to *operationalise* the variables. This is the point we choose an experimental or observational design and decide exactly what can be changed or measured.

For the question "*Does social media worsen depression?"* an observational design is easiest. We would measure hours a day on social media and use a depression diagnosis scale.

An experiment would be tricky but not impossible. We would need to manipulate participants' social media use and measure depression using a depression diagnosis scale

Operationalising variables makes questions concrete for studying. It is also key for whether results can be *generalised*. For example, if we manipulated Facebook use, would the results apply to Twitter?

Exercise 2: Six coffees a day linked to low risk of MS

Re-read the news article "*Six coffees a day linked to low risk of MS*" and answer the following questions:

1. Did the scientists manipulate the variables in this study?

   No.

2. Did this study involve independent and dependent variables or co-variables?

   The scientists did not manipulate the variables, therefore the study used co-variables.

3. What variables were used in this study?

   Co-variable 1: daily coffee consumption.

   Co-variable 2: MS risk.

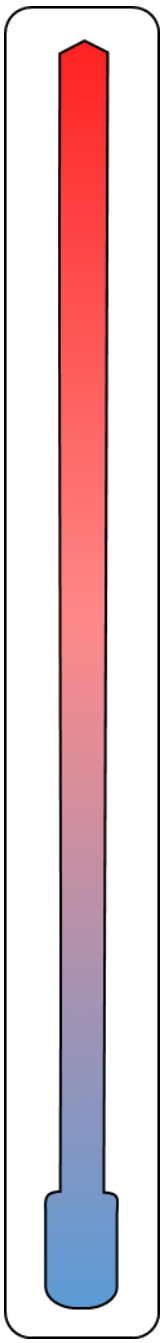
4. Was this study an experimental or observational study?

   Observational.

SCIENCE BAROMETER

Your guide to what's hot and what's not

HOT



NOT

Snacking on walnuts

A handful of walnuts everyday can improve blood vessel function and lower cholesterol. The scientists randomly assigned participants to a diet with or without walnuts and measured health outcomes. The total bad cholesterol fell among those who ate walnuts every day.

Hooray for vitamin D

Vitamin D supplements can reduce the risk of acute respiratory infections. Scientists varied how much Vitamin D participants had and found that vitamin D supplementation resulted in a 12% decrease in the number of patients who had at least one respiratory tract infection. The team cautioned that more research is needed.

Footballer's teeth

Researchers have found that professional footballers' level of dental health is related to their performance on the pitch. Dentists gave the professionals a thorough check up and found that those with poor dental health performed worse on the pitch than their colleagues with pearly white gnashers.

Air pollution and breast cancer risk

A study has found that air pollution is associated with women's breast density, a well-known risk factor for breast cancer. Breast density was measured using data from mammogram screening. This was compared to air pollution data corresponding to the areas where the women lived at the time of their mammogram.

Shaving your pubic hair

Beware no hair! Pubic hair grooming was found to be associated with an increased risk of sexually transmitted infection (STI). Extreme groomers (those who reported removing all of their hair at least 11 times a year) had a 3.5 to 4-fold heightened risk of an STI, particularly for infections such as herpes that arise via skin on skin contact.

Exercise 3: Science Barometer: Your guide to what's hot and what's not

Read the "*Science Barometer: Your guide to what's hot and what's not*". For each study, identify whether the researcher manipulated the variables, tick the type of variable present and write down what each variable is (later issues of the Daily Dose will return to these news articles and what you might conclude about them).

1. Snacking on walnuts

Did the researcher manipulate the variables?	☒ Yes ☐No
☒ Independent Variable ☐ Co-variable 1	Presence of walnuts in diet.
☒ Dependent Variable ☐ Co-variable 2	Health outcomes: blood vessel function and cholesterol.

2. Hooray for vitamin D

Did the researcher manipulate the variables?	☒ Yes ☐No
☒ Independent Variable ☐ Co-variable 1	Vitamin D supplementation.
☒ Dependent Variable ☐ Co-variable 2	Respiratory infection/respiratory tract infection.

3. Footballer's teeth

Did the researcher manipulate the variables?	☐ Yes ☒No
☐ Independent Variable ☒ Co-variable 1	Professional footballers'level of dental health.
☐ Dependent Variable ☒ Co-variable 2	Performance on the pitch.

4. Air pollution and breast cancer risk

Did the researcher manipulate the variables?	☐ Yes ☒No
☐ Independent Variable ☒ Co-variable 1	Air pollution.
☐ Dependent Variable ☒ Co-variable 2	Breast density.

5. Shaving your pubic hair

Did the researcher manipulate the variables?	☐ Yes ☒No
☐ Independent Variable ☒ Co-variable 1	Frequency of shaving pubic hair.
☐ Dependent Variable ☒ Co-variable 2	Risk of sexually transmitted infection.

WALNUTS IMPROVE HEALTH RISK FACTORS

Eating a daily handful of walnuts improves diet quality, blood vessel function and “bad” cholesterol.

Participants were randomly assigned to follow a diet with handful of walnuts each day or a diet without walnuts.

The walnut diet improved a number of health factors. However, it didn’t have any impact on blood pressure or blood glucose levels. Walnuts contain important nutrients such as unsaturated fats, proteins, vitamins and minerals.

The scientists said “Our data suggests that inclusions of walnuts in the diet, with or without dietary counselling to adjust caloric intake, improved diet quality. It may also improve the function of blood vessel cell walls and reduce bad cholesterol in this sample of adults at risk for diabetes”.

The study was published in the journal BMJ Open Diabetes Research and Care.

Exercise 4: Walnuts improve health risk factors

Read the news article "*Walnuts improve health risk factors"* and answer the following questions:

1. What is the difference between the type of variables in the "*Walnuts improve health risk factors*" and "*Six coffees a day linked to low risk of MS*"?

   Walnut study: the variables were manipulated by the researchers (independent and dependent variables)

   Coffee study: the variables were not manipulated by the researchers (co-variables)

2. Define the term Independent Variable (IV)

   The variable that is manipulated (or changed) in an investigation

3. Define the term Dependent Variable (DV)

   The variable that is measured. Its value changes when the independent variable is changed.

4. The news article says that participants were "*randomly assigned to follow a diet with handful of walnuts each day or a diet without walnuts*". Define the term "*randomly assigned*".

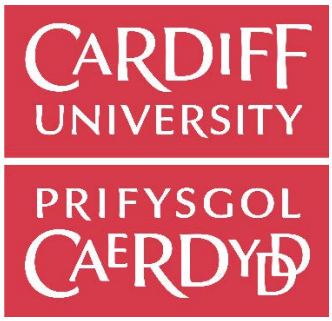
   Randomly assigned: participants have been allocated to groups by chance using a random procedure e.g. using a random number generator

5. Why do scientists randomly assign participants to groups?

   Scientists randomly assign participants to groups to minimise the differences (variation) between groups and eliminate confounding variables.

6. [Advanced] Why do you think is it important that the study was "*published*" in a known "*journal*" (see Daily Dose Issue 2 for how science goes from the workbench to the breakfast table)?

   Research that has been published in a known journal are peer-reviewed which means the work has been scrutinised by other experts before publication. If the work lacks rigor or the article is boring or not clear, they reject it.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