

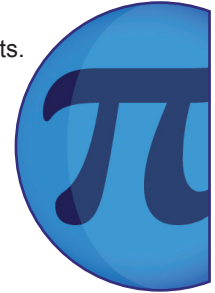


# Can Fish Oil Make You Smarter?

## Key Learning Content

This film explores the claim that fish oil can make you a smarter student. In 2003, British educational psychologist, Madeleine Portwood, investigated this claim by giving school students fish oil supplements. 40% of those given supplements claimed to have better levels of concentration and attention to detail. But could this have been the result simply of being observed – a form of observational bias?

The film explains how a control group was set up and given a placebo; this group showed no change over the study period, suggesting that observational bias was not a factor in the results.



### Core Outcomes

#### Learning Points

- Be able to understand the importance of survey design and sample selection.
- Be able to understand what is meant by observational bias.
- Be able to understand the use and purpose of a control group in statistical research.

#### Suggested Activities

- Review proposals for statistical research and identify possible bias in the approach.
- Design surveys so as to avoid or take account of bias.

### Extension Outcomes

#### Learning Points

- Be able to understand and interpret correlation between data sets.
- Be able to understand that there are many sorts of bias that can affect statistical research.
- Be able to understand the challenges of statistical research in medicine.

#### Suggested Activities

- Make a list of all the different sorts of bias possible in a survey and give short definitions.
- Design a survey that uses correlation to assess results to test the fish oil hypothesis.
- Explore how medical research is conducted and find examples.



Fish oil is rich in the fatty acid omega-3, which has long been positively associated with brain function and behaviour.

## Related Films

To use before the lesson plan:

### The Wrong Guy Won

This film shows how a biased sample led to the wrong prediction in an election.

To use after the lesson plan:

### Mind Control

This film examines the size of differences between experiment results and asks how big these have to be in order to prove a hypothesis.

### Can Eating Fish Prevent Murder?

This film looks at statistics showing that countries with higher fish consumption tend to have fewer murders.

## Guide Lesson Plan

### Introduction

Ask students what they do prior to exams to improve their performance (e.g. revise, sleep more, have a good breakfast, get up early). List and categorise the responses. Ask if any take food supplements and if so, what types. Ask the students if they think that what you eat affects how well you do in exams.

### Show Film

### Can Fish Oil Make You Smarter?

### Main Activity

#### Foundation

Discuss with students the approach and results of the research shown in the film, and agree a definition of observational bias. Discuss how observational bias was taken account of in the survey design using a placebo and control group. Then show students short descriptions of proposed statistical research and get them to identify possible biases in the survey design (e.g. the head teacher is concerned about behaviour among students and thinks that getting them to shake hands at the beginning of a lesson will improve behaviour. The head teacher sits in on a lesson where this is done and observes the subsequent behaviour.)

#### Advanced

Explain that observational bias is just one sort of bias that can affect an experiment and get students to suggest others. Give students descriptions of proposed statistical research and get them to analyse them for possible sources of bias. Categorise the different types of bias then consider what sorts of things can be done to avoid or minimise the effect of each type of bias.

## Extension Activity

### Foundation

Get students to design a survey to test the hypothesis that wearing school uniform makes students work better. Discuss the many difficulties in testing this hypothesis, and use control groups and other techniques to guard against bias.

### Advanced

Explain the concept of correlation. Get students to design a survey to test the hypothesis that eating fish oil makes you a smarter student where results can be analysed in terms of correlation between sets of data. What variables would you try to correlate?

## Optional Extra

Tell students that you have a new experimental drug that may have side-effects, but also may dramatically improve the chances of patients surviving a critical illness. Discuss the difficulties of testing the drug to see if it really works.

