

HYPOTHESIS TESTING – JUST AN ‘EDUCATED GUESS’?

Samantha Walker, Director of Education & Research and
Jane Upton, Research Project Manager, Education for Health

In common usage, a hypothesis refers to a provisional idea or possibility whose merit requires evaluation in order to either confirm or disprove it. You can also think of a hypothesis as a logical supposition, a reasonable guess or an educated conjecture which provides a tentative explanation for something under investigation.

Scientific hypotheses are usually tested using quantitative methods, but generated by qualitative methods. While quantitative research starts with a hypothesis to be tested, qualitative research begins with the intention to explore a certain area, and can often generate ideas and hypotheses as explanations for events or observations (see *BJPCN Respiratory*, December 2006;1(1):11).

For example, say you have heard from lots of hayfever sufferers that they think that their hayfever ruins their exams every summer. This makes you wonder if hayfever does actually cause poor exam performance. You could use this idea to form a question or statement which could then be tested to see if it is true or not.

CONSTRUCTING A RESEARCH HYPOTHESIS

Commonly, hypotheses take three forms, for example:

- a question:
“Is hayfever related to exam performance?”
- a conditional statement:
“Hayfever may affect exam performance.”
- an ‘if then’ statement:
“If hayfever is related to exam performance then people with hayfever will do less well in their exams.”

So what would you need to do next? You could start off with the research hypothesis (also called the alternative hypothesis) that “hayfever is related to poor exam performance”, but poor exam performance could be caused by lots of other things. So how do you know which ones are causing the problem? You would need to start by identifying potential explanations (each one a hypothesis on its own) for poor exam performance. Examples might include the child’s social class, school attended, other co-morbidities (eg asthma, diabetes), recent personal events (eg bereavement, parents’ divorce etc) and medication use. To see which one is causing the problem, you would need to measure each one in lots of children and then see if it had any impact on their exam grades.

If you did this, using appropriate research methods, you may find out, as we did in a case control study, that none of the above possible explanations appeared to relate to poor exam performance, but that hayfever symptoms on the day of the exam did (Walker S *et al. J Allergy Clin Immunol* 2007;120(2):381-7). Thus we have tested and confirmed our hypothesis that “hayfever is related to poor exam performance”.

In some instances, however, your research hypothesis might turn out to be incorrect, and although research papers showing negative findings are not often published, they are important because they add to the body of knowledge on the subject and prevent other researchers going down the same path.

i In the next issue we will be explaining the meaning of the null hypothesis.

