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AS LEVEL Psychology

the student's textbook

Nigel Holt and Rob Lewis

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contents

WHAT YOU WILL LEARN ABOUT

Psychology is a science and for its accumulated knowledge depends on research. To fully appreciate the findings of psychological research it is necessary to understand the methods used by psychologists in their research. This includes knowledge of their strengths and weaknesses of the various research methods used in psychology, as well as an appreciation of their design and conduct. Psychologists communicate the findings of their research, so therefore a familiarity with data analysis and presentation is also essential.

WHAT YOU NEED TO KNOW

Research Methods is in Unit 1 of the specification. As you learn you are expected to develop your knowledge and understanding of Research Methods. You also need to develop the skills of analysis, evaluation and application. Rather than just recall and reproduce information, you are expected to be able to apply a knowledge and understanding of Research Methods to all areas of the specification. The subject content is split into three parts:

Methods and techniques

- Research methods in psychology, including experimental methods, and non-experimental methods such as observation, self-report, correlation and case study
- Advantages and weaknesses associated with these various research methods

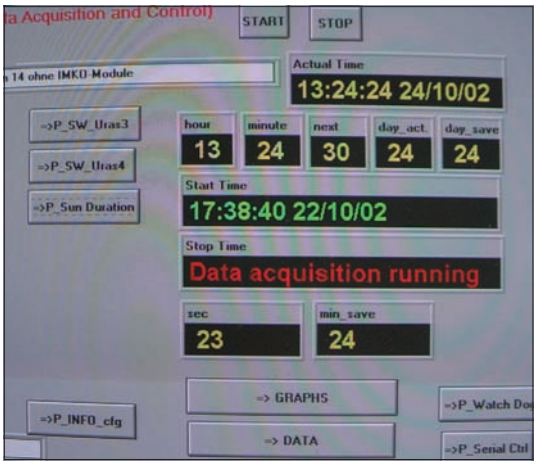
Investigation design

- Designing and conducting psychological research

Data analysis and presentation

- Analysis, presentation and interpretation of psychological research findings

Research Methods



Researchers often use computers to help them with their research.

Psychologists use research to evaluate their theories. The kind of research they do depends partly on the type of theory they are investigating. We use different methods and techniques for different reasons, and we'll talk about that in this section.

DOING PSYCHOLOGICAL RESEARCH

"The research proves tall rats are more confident than short rats. At least I think it does. I've never been good at this."

How do we know whether one idea is better than another? How do we really know why those with dyslexia have the problems they do? Psychologists test their ideas using careful research methods, and what better place to begin than by looking at how best to find things out.

PSYCHOLOGY IS A SCIENCE!

This may come as a bit of a surprise to some of you, but psychology is not all about lying on couches and telling people all about your problems. It is a much bigger subject than that and it progresses very carefully for those who practise it professionally. The goal of psychology is to describe and understand behaviour. This understanding will allow us to predict, control or change the way people behave.

Psychology is a science. This means that psychologists rely on scientific methods of acquiring knowledge in order to achieve their goals, and it is these methods that we will be describing in the following sections. These methods highlight the importance of evidence about human behaviour gathered by careful observation and measurement. This is called *empirical* evidence. An empirical approach assumes that observations are not influenced by emotions or personal opinions; they are *objective*. It is very difficult in psychology to be entirely objective about events – we all have ideas and expectations, about people and why they behave the way they do, which are formed before we begin to look carefully and objectively. Because of this, psychologists have to be extremely careful about how they conduct their research.

When beginning a research project, it is a good idea to go through certain steps, to ensure that we really are investigating what we intend. Similarly, the way we describe what we are researching allows others, who are following our research, to be in no doubt about what is going on. This is very important. In the future, someone may want to check our findings and add to our work, so well thought out and clearly described research is essential. All of this leads us to a discussion of *experimental methods* which is how research in psychology progresses. First of all though, we'll look at the first steps in carrying out research.

AIMS

Psychologists get their ideas for research from either direct observation of behaviour or indirectly through background knowledge and theory. The best attribute you can have as

a psychologist is a real desire to seek out the origins and motives of human behaviour.

Have you ever wondered why a teacher or a friend gets cross or reacts the way they do to something? Why some people have the 'right' attitude and some just do not? What makes the difference between a good athlete and a gold medallist? What role does luck play in our success? What's the best way to remember things for an exam? All of these things really interest us as psychologists.

Once you've decided on an idea for your research the next step is to generate research *aims*. An aim is a reasonably precise idea about the area of the study and what the study is going to try to achieve. It is important that the aim clearly describes the purpose of the proposed research. This will help us make it clear very early on whether or not the proposed research is realistic. An 'aim' doesn't need to be very detailed, it just needs to say very clearly what the focus of your research is all about.

An example of an aim might be 'To describe the effects of stress on our memory', Another might be 'To look at whether listening to music while revising helps us remember things'.

'You shouldn't work in front of the television with members of your family bothering you'. How would you find out whether this really is true?

THE HYPOTHESIS

Once you've got your research aim you need to change it into a statement that psychologists refer to as an *hypothesis*. The idea is to try and find evidence in your research that will 'support your hypothesis'. A hypothesis *predicts* what we expect to find. An example will help here. Take the research aim we used earlier:

Aim: To describe the effects of stress on memory.

Hypothesis: The more stressed we are, the worse our memory will be.

The hypothesis takes the 'aim' and makes a statement of it. Our hypothesis predicts that we will find that people who are stressed will have a worse memory than people who are not stressed. What we now need to do, as researchers, is design a study that lets us investigate this problem. The results of the study will either support our hypothesis or not. If the results do not support the hypothesis we have to reject it, and think again!

How do we use our hypothesis?

The way we use our hypothesis depends on the type of research we are doing. In the type of research we have been describing, we may choose a predictive hypothesis – one that 'predicts' what will happen in our study. We call this an *experimental hypothesis*, because we are doing an experiment. This is often written as 'H_1'. In other types of research, where we are not really doing an experiment but making observations of behaviour or collecting opinions perhaps, the hypothesis is called an *alternative hypothesis* and we use the symbol 'HA' to represent it.

To make the hypothesis complete we also write something called the *null hypothesis*. A null hypothesis (written as 'H_O') predicts that what we find in our research just happened by chance. It looks like the opposite of the main hypothesis. Take the hypothesis we described earlier. This is how we form the null hypothesis that goes with it.

The null hypothesis must be included in our research because psychologists can never rule

out the possibility that the results gained in any investigation are due to chance. What this really means is that if the hypothesis is not supported by the research findings then the null hypothesis is probably true. Put another way, if you have to reject the hypothesis then you have to:

Accept the null hypothesis,

and if you accept the hypothesis because your research supports it then you then you must:

Reject the null hypothesis.

ASK AN EXAMINER

"This is one of those points that is sometimes difficult to get your head around. Forming the NULL hypothesis is important, but really easy. It's not a trick question when you are asked to do it in an exam for instance. Sometimes it's as easy as sticking the words 'DOES NOT' in the sentence. For instance, if our hypothesis was 'Being good at maths means that you will also be good at chess' the null hypothesis is simply 'Being good at maths DOES NOT mean that you will also be good at chess.' Sometimes examiners are not asking sneaky questions! If it looks simple, sometimes it is!"

The hypothesis and operationalising 'variables'

A hypothesis will also express the things of interest to the researcher in the piece of research. These are *variables*. They are called variables because they change or *vary* during the research. Some variables are changed by the researcher, and some change *because* the researcher has changed something. This is much easier to explain with an example: for instance, the time it takes to get to the shops.

You decide to see whether taking different routes to the shops makes your journey time faster or slower. The *variable* under your control is '*the route you take*'. The '*time taken to get to the shops*' varies because of the route you have taken. You (the 'researcher') have changed the route. The time taken to get to your destination changed *because* you have changed the route.

In research, a variable is a something which is observed (looked at and watched), measured (length, temperature or time perhaps), controlled or manipulated. The hypothesis should tell us how these variables will relate to each other in your research. We want to know how the variables will be 'brought into being' or how they will be *operationalised*.

Operationalising variables means putting them in a situation where you can measure them. This is extremely important because we need to be clear about what it is we are studying and measuring in our research. If we are successful, and we are clear enough, it makes it easier for people to understand our findings and compare them to findings from other research.

For example, intelligence is a notoriously tricky area of research because few psychologists agree on what intelligence actually is! A psychologist might be interested in the relationship between 'social class' and intelligence, in which case the terms will need to be made very clear by operationalising them. This involves stating very clearly, in our work, what is meant by the terms 'social class' and 'intelligence', to avoid any misunderstandings, and ensure that people who look at the findings of our research are not confused in any way. We can operationalise social class as 'annual family income'. Intelligence could be operationalised as 'performance on a standard IQ test'. So, now we have the main variables and we have decided how to operationalise them, we can state our aim very clearly.

STUDY IN FOCUS

The duration of short-term memory
Peterson and Peterson (1959)

STM was studied by Brown (1958) and by Peterson and Peterson (1959) and the method has become known as the 'Brown-Peterson' technique.

What they were doing and why? The researchers wanted to know how long information remained in their STM when there was no rehearsal. In order to ensure that they were really measuring duration of STM, participants had to be prevented from repeating information to themselves (i.e. rehearsing it). The Brown-Peterson technique overcomes this and stops people engaging in this maintenance–rehearsal behaviour.

How did they do it? 24 participants were found from the student population at a university. Letter strings of three letters (called 'trigrams', e.g. ZPS) were presented over headphones – they were presented auditorily. After hearing the trigram, participants were either told to repeat what they heard or told to count backwards in threes (i.e. 100, 97, 94, 91, 88 ...) for a set amount of time, which the experimenters called the retention interval. Once the retention interval was reached participants were told to recall the trigram.

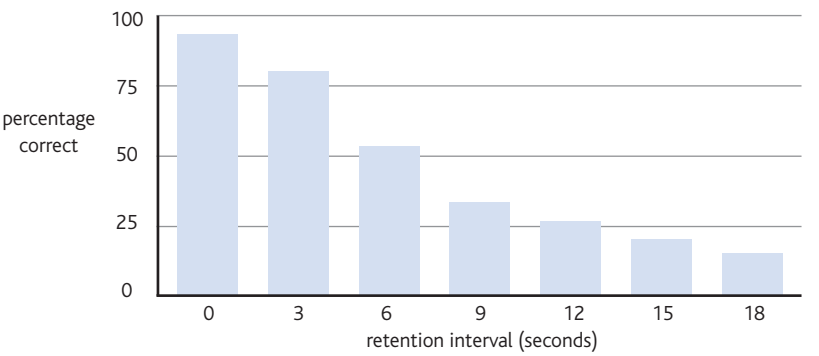


Figure 2: Data redrawn from Peterson and Peterson (1959).

What did they find? The graph shows what happened. The results are very clear. Recall was extremely good with short retention intervals but more mistakes were made the longer the person had to retain the information. At 0 (zero) seconds, retention interval, where recall was required immediately, performance was over 90%, which is extremely high. This dropped off to below 5% when the interval was 18 seconds. They concluded that without rehearsal, the length of STM (its duration) was approximately 18 seconds, and if a second task (a distractor task) is used, the duration is reduced if rehearsal is prevented; very little information remains in STM for very long.

Take a closer look

- The link between this experiment and real life is unclear. Trigrams remembered in a laboratory are not really reflective of the type of tasks our memory usually carries out.
- Using students means that the results may not relate to the general population. Students at university are, hopefully, of above average intelligence so a memory task may show different results with them than if another group of people had been chosen.

ASK AN EXAMINER

"Take a look at the criticisms for the Peterson and Peterson (1959) study. Most studies are done in universities and the vast majority of them use students as participants, so you can use this criticism for many of the studies you will come across! If the study says 'postmen were used' then alter your criticism to 'postmen may give different results from the general population'. Also, notice this was a lab-based study. Many studies, particularly in cognitive psychology, are done in controlled laboratory conditions so this criticism can also be applied to many of your studies."

holding on to information in STM, the rehearsal process is itself easily disrupted – if we are disturbed when rehearsing, the information is, again, lost.

Some researchers distinguish between maintenance and elaborative rehearsal in short-term memory. *Maintenance rehearsal* just keeps information in the short-term store, for example by repeating something over. With *elaborative rehearsal* the information is used and changed in some way. The way that information is rehearsed is important to whether it will ultimately be made more permanent. It is through elaborative rehearsal that information is passed into the long-term store.

LONG-TERM MEMORY (LTM)

Long-term memory is where information is held for some period of time, beyond that of sensory and short-term memory. This could be anything from a few seconds to a lifetime. It is where all our knowledge of the world is stored – every skill, every piece of knowledge, no matter how mundane, is stored here. Without the ability to hold on to information for a period of time, we would not be able to do even the most simple everyday task.

Information in LTM is encoded in terms of its meaning rather than sound. This can be seen in the kinds of errors we make with everyday memory. For example, if we are trying to remember the word 'barn', we are much more likely to remember, by mistake, words which are meaningfully related, such as 'shed' or 'hut', than we are to recall the word 'born', even though it is only one letter different and sounds similar. This would be a sound-based error and is a very unusual mistake to make in LTM. Another word for 'meaning' is semantic and many researchers refer to long-term memory as *semantic memory* because of the tendency for memories in LTM to be organised in terms of their meaning.

The *capacity* of our long-term store seems unlimited. Estimating an upper limit is impossible – the amount of information

	STM	LTM
ENCODING	Mainly based on sound (acoustic)	Mainly based on meaning (semantic)
CAPACITY	Limited (7+/-2 pieces or chunks of information)	Unlimited
DURATION	Short (less than 30 seconds without rehearsal)	Long (potentially a lifetime)

Table 2: A summary of the differences between the short and long-term memory stores.

LIFE CHANGES AND DAILY HASSLES

Our lives change all the time. The major changes might include moving away from home, getting married or dealing with a death in the family. In order to accommodate these changes into our lives changes often need to be made, and these changes can be very stressful. It is not just these major events that can be stressful. We often find ourselves concerned with more 'everyday' worries and hassles, such as money worries and problems with our houses or social lives. This section is concerned with how life changes and daily hassles influence us.

LIFE CHANGES

Major changes in our lives can cause stress. The death of someone close to us, injury, relationship difficulties, starting a new school or college; these are all stressful experiences. These events cause change to our lives in some way: we may be prevented from achieving certain goals because of them, or we may have to adjust the way we think, feel and behave. These events do not need to be obviously negative to cause stress – for example, most people would see a holiday as a positive event but many people experience considerable stress as a result of the preparation and travel involved!

Airports can be very stressful places. Crowds, heat and delays all add up to a recipe for a very stressful day!

One of the most famous studies on the effects of life events was conducted by Holmes and Rahe (1967). They were two doctors who noticed that many of their patients had suffered disruption to their lives during the previous year. They constructed a questionnaire to investigate the possible link between life events and physical ill-health.

They examined the medical records of over 5,000 patients, and from this compiled a list of 43 different 'life events'. These were rated in terms of the time it would take to readjust life back to normality following the event. 'Marriage' was given an arbitrary score of 500, then participants rated the other events in comparison to this. They averaged out the scores and divided them by 10, so in the final

STUDY IN FOCUS

Life changes and stress
Rahe et al (1970)

What were they doing and why? Rahe et al wanted to see whether the onset of an illness could be related to scores on the Holmes and Rahe Social Readjustment Rating Scale (SRRS).

How did they do it? They took an SRRS score from 2,500 male US sailors before they embarked on a six month tour of duty. During the six months medical records were kept which provided a detailed record of the health of each of the sailors. After six months the SRRS score was correlated with an 'illness score'.

What did they find out? They found a significant positive correlation between SRRS score and illness scores. This means that as one went up, so did the other. Remember, this does not mean that one caused the other, just that there is a positive relationship between the two. They were able to conclude that experiencing unpleasant life-changing events increases our likelihood of suffering with illnesses, but experiencing stressful events does not guarantee that illness will result.

Take a closer look

- The research is correlational. We discussed the problems of correlational research in the Research Methods section and this is a good example of the causality problem. We cannot say that life changes cause the illness, only that the two things are related in some way.
- The strength of the coefficient here was very low; in fact it was only marginally significant. It is quite possible that if they repeated this study they would not replicate the findings.
- The sample of participants was very restricted – male US military personnel. We cannot be sure that the same results would be found in females or in people from other cultures.

scale 'marriage' has a score of 50. These scores were called Life Change Units (LCUs). The scale of events starts at 100 LCUs for 'death of a spouse, and ends with 11 LCUs for 'minor violation of the law'. People would add up the score for each life event and this would be their total LCU. They believed that a score of over 300 meant an 80% chance of developing a serious physical illness in the following year.

This relationship between life change, stress and illness was supported in research by Rahe et al (1970). They studied sailors aboard US Navy Cruisers and found a link between life changes and physical illness. The greater the SRRS score for the previous six months, the more likely they were to fall sick some time during their seven month tour of duty.

EVALUATION

Although many studies have been conducted using the SRRS, there are problems with this scale.

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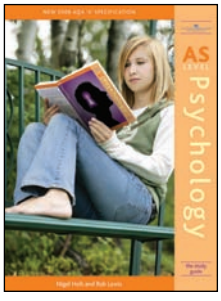

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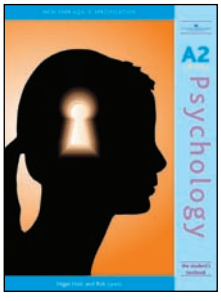

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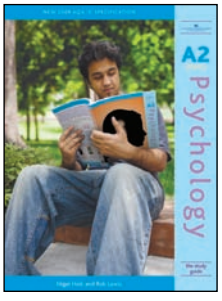

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