**THE BIOLOGICAL APPROACH**

**Introduction**

There are at least three intertwined strands to the biological approach (BIO) to psychology: These are studies of the brain and its actions, the use of evolution as an explanatory device, and the recent development of DNA/Antigen Studies. They cannot be separated completely today, but behavioural genetics only began in the 1990s, whereas the other two date effectively from the explosion in scientific understanding during the second half of the nineteenth century. The brain is the most complex biological entity known to humans. Until the development of the computer, the main methods of understanding the brain came from dissections, case studies and animal experimentation. None of these methods gave any more than partial glimpses of brain operation. Chemical and physical treatments of brain disorders were often without understanding or explanation – the equivalent of hitting a car engine without understanding or explanation. Modern scanning methods have revolutionised biological investigation and made direct real-time visual observation possible.

Using evolution to explain human behaviour began in the late nineteenth century but has been problematic ever since, as there is no concrete evidence of actual human behaviour in prehistory – fossils do not show behaviour. Contemporary most theories demonstrate as much about our modern attitudes as they do about prehistoric humans.

DNA analysis has begun to answer some questions about the development of humans, but the role of genes in behaviour is still a matter of scientific investigation and dispute (especially human language and genetic adaptations). Exactly how the brain works is the greatest scientific mystery of our time and we seem almost as far off as we were 50 years ago. MRI notwithstanding.

**The question: 1a) Outline two assumptions of the biological approach (4)**

**Assumption 1: Behaviour can be explained with reference to specific structures in the brain**

All behaviour is ultimately produced by the operation of systems that connect specific localised regions of the brain. The cortex is largely responsible for thought, language, vision and movement, whereas fine movement and skill execution are dissociated from the action of the cerebellum.

**Assumption 2: Aspects of behaviour can be explained by the action of neurotransmitters**

These chemicals are agents of communication between neurons at the synapse, stimulating or inhibiting the action of the receptive neuron. Examples include melatonin (influences sleep/wake cycles) and serotonin (sleep, arousal and mood).

**Alternative assumption: Behaviour can be explained with reference to human evolutionary history**

Much of our behaviour is determined to some extent by our primate inheritance and the environment that shaped our unique adaptation for survival. Humans are, as a result, intensely social animals, who developed cooperative and planning skills in hostile food-gathering environments.

**Figure 1.1** Can behaviour be explained with reference to our evolutionary history?

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**CHAPTER 1: THE BIOLOGICAL APPROACH**

### The question: 1b) Describe the General Adaptation Syndrome (GAS) (8)

All living organisms have to react to changes in their environment, whether automatically or with a subsequent learnt response. Hans Selye (1947) experimented on rats to see how their body chemistry responded to threats in their environment. He theorised that the basic changes in mammals were the same regardless of the nature of the threat (e.g., extreme temperature, drugs, over-exercise) and that this triad of non-specific responses – the body’s defence against stress – was named the General Adaptation Syndrome (GAS).

**Alarm reaction**

The sympathetic nervous system (SNS) activates the body for action. This is called the ‘fight or flight’ response. There is temporary diversion of blood to the large muscles of the body. Pain detection is suppressed and the body performs an involuntary set of movements called the ‘orienting response’ (move sensors towards the potential threat, tense the muscles and make evasive moves). The hypothalamic triggers adrenaline and noradrenaline release from the adrenal medulla, which in turn triggers mechanisms to combat the stress for a longer period of time.

**Resistance or adaptation**

If the threat does not go away, the body moves towards long-term protection; it secretes further hormones, including cortisol from the adrenal cortex that increase blood sugar levels to sustain energy and raise blood pressure. Overuse by the body’s defence mechanism in this phase eventually leads to disease. If this adaptation phase continues for a prolonged period of time, fatigue will occur; pain will increase and concentration will lapse. This period varies greatly depending on the nature of the threat and the body’s already existing reserves.

**Exhaustion**

In this stage, the body has run out of its reserve of body energy and immunity. Mental, physical and emotional resources suffer heavily. The body experiences ‘adrenal exhaustion’.

Blood sugar levels decrease as the adrenals become depleted, leading to decreased stress tolerance, progressive mental and physical exhaustion, illness and collapse. Continuously high cortisol levels lead to suppression of the immune system.

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**Figure 1.2** The biological approach is the study of the brain and its actions.
The main assumption of the biological approach is that behaviour can be explained with reference to specific structures and functions of the brain.

How does this assumption link with the general aim of biological therapies?

Biological therapies are based on altering structures or functions of the brain in order to change behaviour in some way, whether physically or chemically.

What is the aim of chemotherapy, and what biological assumptions link with this?

Chemotherapy aims generally to alter the chemistry of the brain, usually in transmission at the synapse. This changes the nature of a behaviour or emotion governed by the action of those neurons.

What is the procedure of chemotherapy?

Psychotropic (mind-changing) drugs are classified according to their target behaviours; the main groupings are of drugs to tackle anxiety–based disorders, depression, and psychotic conditions such as schizophrenia.

Anxiolytics reduce anxiety, and since they tend to calm patients are also known as minor tranquillisers. In larger doses they have sedative effects (i.e. induce sleep) and they are also very addictive.

There are many antidepressants, such as modified tricyclics, which have a variety of blocking effects on various neurotransmitters or the enzymes that break down the transmitters. SSRIs (specific serotonin reuptake inhibitors) are the more common drug of choice today; they make more serotonin available at the synapse by blocking its re-absorption, and therefore lighten moods.

Antipsychotics are also known as major tranquillisers and are used to treat the unusual (or positive) symptoms of major disorders, such as hallucinations, delusions and psychomotor excitement.

Delivery of drugs is either oral or by injection. Oral delivery gives slower absorption and requires a higher dose due to losses during digestion, but is a very flexible method; injection requires a second person, has potential for infection, is invasive, but is more effective for a smaller dosage.

Psychosurgery aims to physically alter the structure of the brain.

Psychosurgery has a long history. A process called trepanning or trephining - cutting a hole in the skull to relieve intracranial pressure - has been practised for possibly 40,000 years, and is still an emergency medical procedure used today.

Modern psychosurgery was born when Moniz noticed a research report that chimps showed less anxiety when the prefrontal cortex was surgically severed. He went on to try this on humans using a wire loop (leucotome) inserted into the frontal lobe by a hole in the skull, and then rotated to remove or sever pieces of lobe.

Initially influenced by Moniz, Walter Freeman broke with him in the 1940s and popularised a crude and dangerous version of the leucotomy, using an ice-pick inserted or even hammered through the orbit of the eye up into the brain (transorbital lobotomy). He often did this ‘on the road’, with local anaesthetic and negligent antiseptic procedures!

Psychosurgery became very popular, especially after the Second World War, with an estimated 40,000 lobotomies in the USA, 17,000 in the UK and many more throughout Europe. These procedures fell into disrepute due to the introduction of major tranquillisers and major political and legal challenges in the USA during the 1960s and 1970s.

Modern neurosurgery uses MRI scans to locate precise areas to operate on. Areas are burnt away via electrodes or using focused radiation (gamma knife). These operations are successfully used for obsessive-compulsive disorder (OCD), depression, eating disorders and Parkinson’s disease.

The main assumption of the biological approach is that behaviour can be explained with reference to specific structures and functions of the brain.
The question: 3b) Evaluate two weaknesses of the biological approach (6)

- BIO ignores everything except biological effects, and especially ignores social causes of behaviour. This is a reductionist approach. As social animals, much of our social behaviour is determined and influenced by other people, so to ignore these effects is to ignore a major cause of behaviour. We can override our biology in some cases, for social and moral reasons, for example, instead of mating with any partner, who we may wish if it is strongly influenced by culture, such as is currently fashionable.

- In BIO, individual differences are ignored and generalisations made about all humans in a way that diminishes and ignores the individual (called a 'nomothetic approach'). The person, their personality and what makes them unique is ignored. Individual body chemistry differences can mean totally different responses and behaviours – for example, for the same dosage of a drug. The tranquilliser Valium produces.

The question: 5) Explain and evaluate the methodology used by the biological approach (12)

<table>
<thead>
<tr>
<th>METHOD</th>
<th>DESCRIPTION</th>
<th>EXAMPLE</th>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
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<td>Dissection</td>
<td>Brain of dead people is studied in depth, by cutting it up, brain damaged by accident or illness.</td>
<td>Famous examples include Phineas Gage (prefrontal lobes and personality), HM, Clive Wearing (severe amnesia)</td>
<td>Detailed information from millions of post-mortems</td>
<td>Reliability issues – findings have to be repeated</td>
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<td>Routine post-mortem (e.g. Broca's study of 'Tan')</td>
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<td>Case study</td>
<td>A single person is studied in depth, usually because some brain damage has occurred</td>
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Maximising the marks

Each strength and weakness should be explained using the **Point – Explain – Example (PEE)** structure.

Maximum marks are obtained for:

- detailed and technically correct ‘Point’
- detailed and technically correct ‘Explain’
- detailed and technically correct ‘Example’
THE BEHAVIOURIST APPROACH

The question: 1a) Outline two assumptions of the behaviourist approach (4)

Assumption 1: Human behaviour is caused and influenced by events in our environment alone

Behaviourists see humans as blank slates; with no predetermined behaviours. Human behaviour is created through the operation of the principal processes of learning – classical conditioning, operant conditioning and social learning.

Alternative Assumption 1: Skinner’s assumption

Radical behaviourism assumes that the experiences we label as mental events are essentially fictions, and the behaviour attributed to them can be more effectively explained in other ways – that is, without recourse to intentions, thoughts or plans. If you wish to use these, follow the PEE method (Point – Explain – Example), making sure there is a technically accurate ‘Explain’ at the core of your answer.

Assumption 2: Psychologists should focus on observable, measurable events in order to be scientific

Since mental events cannot be directly observed or measured, they should not be included in scientific explanations of behaviour. Therefore the behaviourist approach rejects self-reports and opinions.

Alternative assumption

WJEC also accepts descriptions of classical conditioning and operant conditioning as assumptions.
The question: 2) Describe how the behaviourist approach has been applied in either systematic desensitisation or aversion therapy (12)

Systematic desensitisation

The main assumption of the behaviourist approach is that all behaviour is learnt in response to changes in the environment.

How does this assumption link with the general aim of behavioural therapies?

Behavioural therapies all assume that a maladaptive (problem) behaviour can be altered or extinguished by a suitable training programme based on learning principles.

What is the aim of systematic desensitisation, and what behavioural assumptions link with this?

The therapy involves classical conditioning a new response (relaxation) to a stimulus that previously evoked an unjustifiable fear response (phobia). This is called response substitution. Behaviourists believe that all responses can be relearnt or modified using conditioning techniques.

What is the procedure of systematic desensitisation?

There are three steps to the process of systematic desensitisation of a phobia:

1. The patient learns a relaxation response in a series of training exercises led by the therapist. Some patients learn very quickly, others take a long time.

2. While this is continuing, the patient constructs a graduated scale of phobic response, from low anxiety (e.g., a picture of a bird) to extreme anxiety (e.g., a bird perched on the hand). This is then used as a ladder of progress in therapy.

3. The patient is then exposed to the lowest step on the ladder and practises the relaxation response. Once they can relax consistently, they are exposed to the next level of anxiety. Success is judged either by relaxation achieved at the most extreme step of the ladder, or when the patient judges their life to be acceptably improved.

Aversion therapy

The main assumption of the behaviourist approach is that all behaviour is learnt in response to changes in the environment.

How does this assumption link with the general aim of behavioural therapies?

Behavioural therapies all assume that a maladaptive (problem) behaviour can be altered or extinguished by a suitable training programme based on learning principles.

What is the aim of aversion therapy, and what behavioural assumptions link with this?

The therapy involves removing an undesirable response to a stimulus (e.g., pleasure and alcohol) by associating one stimulus with another (e.g., alcohol and severe nausea) using classical conditioning.

What is the procedure of aversion therapy?

In the case of alcohol, patients are given a saline solution with an emetic (drug to cause nausea and vomiting). They are then given a glass of whisky, which they smell, taste and then drink. If vomiting does not occur, they then get further whisky and beer plus the emetic. Further repeats involve a wider range of alcoholic drinks. In between treatments, soft drinks are provided so that aversion does not develop to all drinks and to promote the use of alcohol substitutes.

A controversial use has been to treat sexual orientation and preferences by pairing erotic pictures with electric shocks; however, this has been largely disused since the 1970s, following changes in social attitudes.

Figure 2.3 Systematic desensitisation can be used to treat phobias

Figure 2.4 Aversion therapy, a behavioural treatment, can be used to treat alcoholism
Maximising the marks

Each strength and weakness should be explained using the Point – Explain – Example (PEE) structure.

Maximum marks are obtained for:

- Detailed and technically correct ‘Explain’
- Detailed and technically correct ‘Example’.

The question: 3b) Evaluate two weaknesses of the behaviourist approach (6)

**BEH does not accept mental events as causes, although they clearly can be.** We can decide to do something we have never done before (e.g. take a chance on a new experience), and people can resist reinforcements and punishments purely for an idea they may have (e.g. resisting torture for a cause they believe in). A complete psychology has to account for some forms of mental events to be credible.

**BEH can offer no explanation at all of many important human behaviours, such as creativity and humour.**

Creativity involves producing something that has not been done before in the same way and is recognised by others as unique and worthwhile in some way. Examples are found in art and music. Behaviourism may be able to point to the acquisition of influences and skills (e.g. keyboard technique), but cannot show how these activities develop in total, because most of the unique activities are thought processes, and thus unobservable.

The question: 3b) Evaluate two weaknesses of the behaviourist approach (6)

**BEH highlights the way the behaviour of others causes and reinforces our behaviour.** We learn via observation (e.g. social learning of aggression) and other people reinforce our behaviour, such as parents approving or disapproving of things we do (operant conditioning). We also learn associations between objects and internal states, such as between food consumption and pleasure (classical conditioning).

**BEH emphasises the scientific nature of psychology by shifting the focus onto observable and measurable events.** Ideas and thoughts are only reportable, not directly measurable, so may not be true, accurate or reliable. To gain accurate knowledge, only measurable events can be used in psychology if it is to be scientific in the same way as physics.

The question: 5) Explain and evaluate the methodology used by the behaviourist approach (12)

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<td>Animal experiments</td>
<td>Standard investigation of cause-effect relationships using highly controlled, laboratory-based studies</td>
<td>Pavlov’s use of dogs to investigate digestion, leading to the investigation of conditioning</td>
<td>Animals: are cheap, have faster reproductive cycles, do not have to consent, can be harmed more than humans</td>
<td>Ethical concerns have led to a huge reduction in animal experiments. Animals are not direct analogues for humans in many behaviours (e.g. thoughts, sex). Animal behaviour in unnatural circumstances is abnormal</td>
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<tr>
<td>Human ‘field’ experiments</td>
<td>Highly controlled studies in natural settings, usually some form of institution where considerable behavioural control is normal</td>
<td>Token economy studies in mental hospitals: Bandura’s study of aggression in children</td>
<td>Actual human participants, partly realistic situations (ecological validity), high levels of control ensure valid conclusions about cause-effect relationships can be made</td>
<td>Ethical problem of consent from patients or children, ethical problem of freedom to leave the study, ethical problem of fair treatment - many token economy studies used rewards that should be part of normal life (e.g. cinema visits)</td>
</tr>
<tr>
<td>Case studies</td>
<td>In-depth study of a single individual, often typical of therapies</td>
<td>Wolpe’s development of systematic desensitisation via study of animals and then treatment of anxiety disorders</td>
<td>High levels of qualitative information, usually conducted very ethically, can inform further research, generally ecologically valid</td>
<td>Cannot achieve high levels of control, much information is subjective self-report from participants</td>
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ASCH (1955): OPINIONS AND SOCIAL PRESSURE

Context
Goldstein Asch was a Polish immigrant who had a very distinguished career as a social psychologist in the USA. Work on conformity first came to prominence with the studies of Solomon Asch. This was an experiment on informational conformity. This is where a situation is ambiguous – that is, it could be interpreted in more than one way. We tend to look for clues to enable us to make a decision.

Aim
Asch decided to work with an unambiguous stimulus, one that is very clear to the participant. He aimed to look at normative conformity, which is whether participants would change their answer towards a group norm, even if their judgement told them otherwise. This is clearly a much more powerful type of conformity, requiring denial of a personal judgement and acceptance of a group norm that is clearly incorrect.

Method
Asch aimed to test the strength of normative conformity by presenting participants with a group norm regarding a physical judgement that is clearly wrong.

Results
Asch's results were quite striking. In one condition, 75% of participants conformed at least once, and 25% conformed on all trials. In another condition, 33% of participants conformed at least once, and 8% conformed on all trials.

Summary
Asch aimed to test the strength of normative conformity by presenting participants with a group norm regarding a physical judgement that is clearly wrong. His results showed that people are more likely to conform when they are in a group and have a clear group opinion. This has important implications for understanding how people make decisions and conform to group norms.

Critical assessment

Perrin and Spencer (1980) suggested that the Asch effect was a 'child of its time'. They carried out an exact replication of the original Asch experiment using engineering, mathematics, and chemistry students as subjects. The results were clear-cut on only one out of 396 trials did an observer join the erroneous majority. They argue that a cultural change has taken place in the value placed on conformity and obedience and in the position of students in America in the 1950s questioning role. This implies that Asch's results were not generalisable cross-culturally.

Nicholson et al. (1985) were more positive, finding that the number of error responses obtained was significantly lower than those reported by Asch, but it was also significantly greater than zero (12 out of the UK sample of 38 and 8 of the US sample of 21 conformed at least once). British and American students did not differ in their responses to unanimous peer-group opinion. This provides some support for Asch.

Lalancette & Standing (1990) repeated the classic experiment and variations, yet no conformity was observed. They concluded that the Asch effect appears to be an unpredictable phenomenon rather than a stable tendency of human behaviour.

Neto (1995) repeated the classic conformity experiment, using women psychology students in a Portuguese university as minority of one unanimous group, and control participants. The original procedure was re-enacted using a computer program. Among participants in the experimental condition, 37.7% conformed at least once, 27.7% conformed at least once, 3.1% made more than three errors. Participants were more positive, reported considerable distress under the group pressure. This provides recent and powerful support for Asch's original result. This was also true of Boen et al. (2006), who used a panel judgement task similar to that used in the popular television dance contests Strictly Come Dancing and demonstrated conformity of opinion when the panel heard each other's feedback.

There are substantial cultural differences, leading Smith & Bond (1996) to characterise countries as either individualist (e.g. USA) or collectivist (e.g. Japan) – conformity being higher in collectivist societies where the group is considered more important than the individual.

Summary: norms and conformity to them are made socially in a culture. When cultures change, norms and conformity change too, and so do the results of Asch replications. Asch's study is very strong, but has low reliability. Every replication brings different results.
Sample: 123 male college students were selected on a voluntary basis from four American universities. Each was paid $3 to participate in a study that involved a visual judgement task. Design: They were tested in groups of seven to nine participants. Only one participant in each group was a real participant (the naive participant). The participant was seated sixth in a row of seven people. The others were confederates of Asch. (A confederate is a person who acts as if she is a participant but is really following the instructions of the experimenter.) Each group was shown two pieces of card. One had a ‘standard’ line printed on it; the other had three lines of varying length.

**Procedure**

- Each member of the group had to state aloud, in turn, which line they thought was the same length as the standard line.
- The true participant could see that one of the lines was obviously a match, the others obviously wrong.
- The answers were given in the order in which they were seated in the room, and on the first round every person chose the same line, which was the matching line.
- Then another set of cards was shown, and again the group was unanimous.
- On the third trial, and several later ones, the confederates unanimously gave the wrong answer.
- In all there were 18 trials, 12 of which were ‘critical’ in that the confederates deliberately gave wrong answers.

**Findings**

- In the control condition, where confederates gave the correct line each time, the naive participants answered correctly 98 per cent of the time (this gave Asch a baseline error rate).
- In the experimental condition, where the confederates gave the wrong answer, the naive participants were only correct in 33.2 per cent of cases.
- Participants conformed to the incorrect answer on 36.8 per cent of critical trials.
- 28 per cent of participants never conformed and gave their own answer.
- 5 per cent of participants conformed on all trials all of the time.
- 75 per cent of participants conformed at least once on critical trials.
- Participants were interviewed afterwards and asked why they conformed:
  - Distortion of perception – some participants believed the confederates were right.
  - Some participants wanted to please the researcher, and not ‘spoil’ the results.
  - Many of the participants thought they had a deficiency in themselves (e.g. poor eyesight), which they wanted to hide to avoid being laughed at.

**Conclusions**

- Some people will conform to group norms even when the answer is clearly wrong.
- This shows that conformity is a powerful influence on our behaviour.
- Asch (1955) said: ‘That we have found the tendency to conformity in our society so strong that reasonably intelligent and well-meaning young people are willing to call white black is a matter of concern.’
- However, it is important to note that the participants remained independent on two-thirds of trials.
- Participants who did not follow the lead of the confederates held on to their own beliefs.

Some teenagers take up smoking to conform with their group of friends.
Evaluation of method – strengths and weaknesses

Design
- The experiment lacked ecological validity – it is not very often in everyday life that people are asked to judge the length of a line against three other lines!
- As this was a laboratory experiment it was conducted in controlled conditions. This allowed Asch to determine cause and effect when measuring conformity.

Sample
- The sample size of 123 participants was large.
- Using four different universities prevented participants being aware of the research purpose simply by word of mouth (participant expectations).
- The fact that they were all similar in demographic details (age, sex, etc.) means that they were with their peers. People are more likely to conform with peers in real life.
- The similarity in demographic details also means that potential confounding variables (e.g., gender differences) were removed from the experiment.

Ethics
- The participants were not able to give their fully informed consent as it would have been impossible to carry out the study if the participants had known the true nature of the experiment.
- Participants did not appear to suffer lasting harm.
- Participants were allowed to explain their actions in a debrief.
- Participants were subjected to a stressful situation and experienced temporary discomfort.
- No attempt was made to discover if lasting damage to self-esteem had occurred.

Reliability
- The results of other studies suggest that no standard method of measuring conformity works in every culture and therefore external reliability is low.

Validity
- Estimating line lengths is not a valid surrogate (substitute) for social opinions and attitudes.

Figure 6.4 As Asch's sample was made up of white American men, the results may not be generalisable to other groups.
**RAHE, MAHAN & ARTHUR (1970): STRESSFUL LIFE EVENTS**

**Context**

Anything that happens in a person’s environment causes some form of reaction in the body (General Adaptation Syndrome). Stressful events cause long-term physical and psychological effects (which we call stress). The drain on the body’s resources following continued stress causes damage to the immune system and makes people more likely to get infections or other physical illnesses, as well as psychological states.

**Aim**

To investigate the impact of life events, as measured by a life-stress test (SRT) on health, in serving US Navy personnel, using a prospective research design.

**Definitions**

1. Retrospective design: measure variable 2, then look backwards in time to try to measure variable 1.
2. Prospective design: measure variable 1, then wait for a period of time and measure variable 2.

**Critical assessment**

The Social Readjustment Rating Scale (SRRS) was tested with several samples of US populations and with Asian groups in Japan and South East Asia (Holmes & Masuda 1973). It became an established stress test and is a good predictor of psychological and physical illness (Müller 1989).

However, one of the major criticisms of the life-event approach was that many people do not experience these major events; yet seem to get stress-related illness. Goldberg & Comstock (1980) found that 1/3 per cent of a sample of 2,600 adults had not experienced any of the listed life events in the preceding year. This suggests that the link between stress and ill-health is not as straightforward as Holmes & Rahe’s study might suggest.

There is certainly a clear link for types of cancer; Palesh et al. (2007) found that relatives in breast cancer patients were linked to stressful life events and there are links for other conditions such as heart disease (Abraham et al. 2008). However, a major confounding issue is that some life events (e.g. loss of employment) may be symptoms of a developing illness (Penny 1996) and many overviews of the field conclude that linking evidence in general is weak (Abraham 2008).

The life-events list itself is not only out of date (Lazarus 1999), but it does not take the context of the life event into account (Forshaw 2002). A divorce may be rated 100, and all other events proportionately less. This list was then used to try to predict ill-health by getting individuals to add up their life events, and then see if they became ill. This is actually very difficult to do in a valid manner in real life.

Many of the studies were retrospective, using people who were already in hospital and looking back over their recent lives – this method is very prone to errors of recall (e.g. Rahe 1964).

A prospective study, which looks at data that emerge from the present upwards, is not subject to this. Rahe was a medical student when he worked with Holmes (a psychiatrist) and is a qualified doctor who specialises in stress-related medical problems. He worked for the US Navy for 20 years, and this study was part of a massive research programme funded in the 1960s and 1970s by the Navy (as was Zimbardo’s prison study). The US Navy wanted to understand how to change its environments to affect ill-health and behaviour, and how better management of those environments could affect health and behaviour.

Holmes and Richard Rahe (1967) developed existing methods of quantifying stress except by self-reports. Thomas Holmes and Richard Rahe developed existing life-event measurement scales that they tested in various forms during the 1960s and early 1970s. They were pioneers of a new approach to stress studies. The Schedule of Recent Experiences (SRE) was the original list (Holmes & Hawkins 1957) that was used in its developed form by Rahe in this study.

A large sample of ordinary people rated the relative impact of a list of life events presented to them by the researchers. The ratings were then averaged and converted into a set of standardised scores, where ‘death of a spouse’ rated 100, and all other events proportionately less. This list was then used to try to predict...
Figure 7.2 Stress makes people vulnerable to physical illnesses

**Procedure**

**Sample:**
- All-male sample of serving US Navy personnel (women not allowed on the front line at that time).
- 2,664 men on three carriers on active service.
- Average age was 22.3.
- Two-thirds of the men were high school graduates.
- Length of service ranged up to 30 years.
- Sample represented over 90 per cent of the men on the ships.

**Design:**
- A double-blind study in that neither the sample nor the staff analysing medical records knew the purpose of the study.
- A modified version of SRRS (SRE) completed every 6 months over a period of 2 years.
- Life Change Units score (LCU) was calculated from the established questionnaire (SRRS).
- Followed by a tour of duty of 6 to 8 months.
- Medical records were then scrutinised and assessed independently of the researcher by medical staff, and a health score compiled using number, type and severity of illness.
- Any participants with previously known conditions were not used, nor were those who were reported to be faking or shirking work.

**Analysis:**
- LCU scores were banded (1 to 10) and grouped – the higher the LCU band, the higher the mean illness rating.
- LCU scores and health scores were correlated.

**Findings**

<table>
<thead>
<tr>
<th>LCU bands</th>
<th>Mean illness score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 + 2</td>
<td>1.903</td>
</tr>
<tr>
<td>3 + 4 + 5</td>
<td>1.591</td>
</tr>
<tr>
<td>6 + 7 + 8</td>
<td>1.676</td>
</tr>
<tr>
<td>9 + 10</td>
<td>2.064</td>
</tr>
</tbody>
</table>

- The only positive correlation was between LCU (6 months prior to cruise) and medical score.
- $r = 0.118$ is high for such a large sample.
- The higher the LCU score, the higher the mean illness rate.
- The highest LCU scores (195–1,000) – a small minority – had much higher illness rates than the majority (0–194).
- There was a clear relationship between TLCU (total life change units) score and later illness rates.
- Both TLCU scores and illness rates were low relative to a general population.
- More accurate predictive power in older sailors than younger.
- The strongest correlation between LCU scores and illness rates was found on the two ships that did not see action.

**Conclusions**

- Higher LCU scores in the 6 months prior to departure were associated with higher illness rates during the tour of duty.
- The links were stronger for older men and married men.
- The life-event approach correctly predicted a significant correlation between LCU score and illness rate (predictive validity).
**RAHE, MAHAN & ARTHUR (1970): STRESSFUL LIFE EVENTS**

**Evaluation of methodology – strengths and weaknesses**

**Design**
- This was a prospective, not retrospective design.
- Restricted environment enables control and scrutiny of all variables.
- Double-blind study reduces demand characteristics to a minimum.
- Prospective design provides valid and largely uncontaminated data.
- Showed very clear positive correlation between stress score (TLCU) and illness frequency, showing TLCU is a valid test (high predictive validity).

**Sample**
- Biased sample: Rahe suggests that in a more normal population, the correlation between the two variables would probably be larger, as the sample was very fit people with heightened resistance to illness.
- Relatively homogeneous sample.
- Reduction in number of extraneous variables (e.g., gender, gender interactions). Opportunity sample, easy to acquire once permission was granted.
- It was customary for crew to report even minor illnesses, so data were comprehensive.
- Figure 7.3 The Navy personnel were all fit; in the general population, the relationship between stress and illness might be even stronger.

**Ethics**
- Once permission was granted by the US Navy Command, there were no issues with consent or deception, as the Navy held those permissions, not the men.
- The reliability of self-reporting of stress is questionable; people tend to change their reports over time (Raphael et al. 1991).
- The medical records were comprehensive and systematic, so the method was highly reliable.

**Validity**
- Confounding factor was combat stress, which tended to obscure other stresses (cruiser 2).
- Figure 7.3 The Navy personnel were all fit; in the general population, the relationship between stress and illness might be even stronger.

**Reliability**
- Prospective design provides valid and largely uncontaminated data.
- Showed very clear positive correlation between stress score (TLCU) and illness frequency, showing TLCU is a valid test (high predictive validity).
DOING THE METHODS QUESTION

The question: A) Outline one advantage and one disadvantage of using [a method] in this research (3)

<table>
<thead>
<tr>
<th>Method</th>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation</td>
<td>Real-life behaviour in its natural environment</td>
<td>No control over any variables</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Observer may be biased in recording data</td>
</tr>
<tr>
<td>Experiment (lab)</td>
<td>Higher degree of control over variables</td>
<td>May be a very artificial environment (lacks realism)</td>
</tr>
<tr>
<td>Experiment (field)</td>
<td>(Partly) real-life behaviour in its natural environment</td>
<td>No control over all variables</td>
</tr>
<tr>
<td>Experiment (natural)</td>
<td>Independent variable (IV) occurs naturally in the real world</td>
<td>Cannot show cause-effect relationships between variables</td>
</tr>
<tr>
<td>Correlation</td>
<td>Shows relationship between variables</td>
<td>Cannot generalise to other cases or the population</td>
</tr>
<tr>
<td>Case study</td>
<td>Loss of detailed qualitative information</td>
<td></td>
</tr>
</tbody>
</table>

The question: B) Identify one issue of reliability in this research and describe how you would deal with this issue of reliability (3)

- **A definition of reliability related to the scenario**
- **THINK – LINK** using one of the two methods below
  1. One way of ensuring reliability in research.
  2. Repeat the research using the same method and the same sample.

The question: C) Identify one issue of validity in this research and describe how you would deal with this issue of validity (3)

- **A definition of validity related to the scenario**
- **THINK – LINK** using one of the three methods below
  1. Ensure that the dependent variable (DV) is actually measuring what it is suggested to be measuring.
  2. Ensure that your variables are related to the problem you are investigating (construct validity).
  3. Check your method and result against a well-established method or well-established set of results (concurrent validity).

The question: D) Outline one advantage and one disadvantage of [a sampling method] in this research (3)

<table>
<thead>
<tr>
<th>Sampling method</th>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunity</td>
<td>Easy to arrange and select participants</td>
<td>Not representative of the population</td>
</tr>
<tr>
<td></td>
<td></td>
<td>May be biased by the experimenter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>towards their hypothesis</td>
</tr>
<tr>
<td>Self-selecting (volunteer)</td>
<td>No problems of consent</td>
<td>Volunteers tend to be different from non-volunteers and not representative of population</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Initially very time-consuming</td>
</tr>
<tr>
<td>Random</td>
<td>The most scientific method</td>
<td>People may refuse to take part</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficult to organise</td>
</tr>
<tr>
<td>Systematic</td>
<td>A scientific method</td>
<td>People may refuse to take part</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficult to organise</td>
</tr>
<tr>
<td>Stratified</td>
<td>Has correct proportions from the population</td>
<td>Time-consuming to gain a sample</td>
</tr>
<tr>
<td></td>
<td>(e.g. male and female)</td>
<td>People may refuse to take part</td>
</tr>
</tbody>
</table>

The question: E) Discuss one ethical issue that might arise in this research (3)

- **THINK – LINK** saying how the issue might arise.
- **Defininition of a common ethical issue using the words of the scenario.**

Overview

- Six questions are set.
- They occur in the same order.
- The only things that change are the words in the square brackets [...].

All answers must contain a key phrase or sentence that quotes part of the scenario or uses material from the scenario.

THINK – LINK

The question: F) State one conclusion that can be drawn from [some feature of the results table] in this research (3)

- You must state the obvious from the table or chart.
- You must include every detail, not just a conclusion.
- Remember that three marks means 3 minutes of writing time – there should be at least two long sentences:
  1. Literal description of the data display.
  2. Conclusion to be drawn from the data display.

Mean recall of words in memory test

<table>
<thead>
<tr>
<th>Trained condition</th>
<th>Control condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.4</td>
<td>8.8</td>
</tr>
</tbody>
</table>

- **Bad:** Memory was better in the trained than the control condition.
- **Good:** The mean recall in the trained condition (13.4) was substantially higher than the mean recall in the control condition (8.8).

This suggests that the training regime led to improved recall in this experiment.