

Stress

A2

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Last checked 6 October 2026

Read first: **Research methods, Validity, reliability and replicability**

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What you need to know

Stress is the fourth topic of the Health psychology option (Papers 3 and 4). It has three parts: where stress comes from, how to measure it, and how to manage and prevent it. You should be able to:

1. **The physiology of stress:** the **GAS model** (general adaptation syndrome) and the **effects of stress on health**.
2. **Causes of stress: life events** (Holmes and Rahe), **work**, with a study such as **Chandola et al. (2008)**, and **Friedman and Rosenman's Type A personality**.
3. **Biological measures of stress: recording devices** for heart rate and brain function (**fMRI**), with a study such as **Wang et al. (2005)**; and **sample tests for salivary cortisol**, with a study such as **Evans and Wener (2007)**.
4. **Psychological measures of stress: self-report questionnaires**, including tests of **Type A personality** and Holmes and Rahe's **life events questionnaire**.
5. **Managing stress:** the psychological therapy **biofeedback**, with a study such as **Budzynski et al. (1969)**, and the use of **imagery**, through the key study **Bridge et al. (1988)** on relaxation and imagery during medical treatment, which you must know in detail.
6. **Preventing stress:** the **three phases of stress inoculation training (SIT)**.
7. **Evaluate all of it** with the issues the syllabus names for this topic: individual and situational explanations, reductionism versus holism, determinism versus free will, idiographic versus nomothetic, generalisations from findings, questionnaires, psychometrics, subjective and objective data, validity, reliability, application to everyday life and ethics.

Studies marked "e.g." in the syllabus can be swapped for another suitable one; the key study cannot. Before 2024 the topic also had **medical (biochemical) techniques** for managing stress; they are under "Older syllabus content" because older questions ask about them.

Understand it

The topic at a glance

Part	What it covers	Study to know
Sources of stress	The GAS model; effects on health	Selye (1936)
Sources of stress	Life events; work; Type A personality	Holmes and Rahe (1967); Chandola et al. (2008); Friedman and Rosenman (1974)
Measuring stress	Heart rate and fMRI; salivary cortisol	Wang et al. (2005); Evans and Wener (2007)
Measuring stress	Type A tests; the life events questionnaire (SRRS)	Friedman and Rosenman; Holmes and Rahe
Managing stress	Biofeedback; relaxation and imagery	Budzynski et al. (1969); Bridge et al. (1988), key study
Preventing stress	Stress inoculation training, three phases	Meichenbaum (1985)

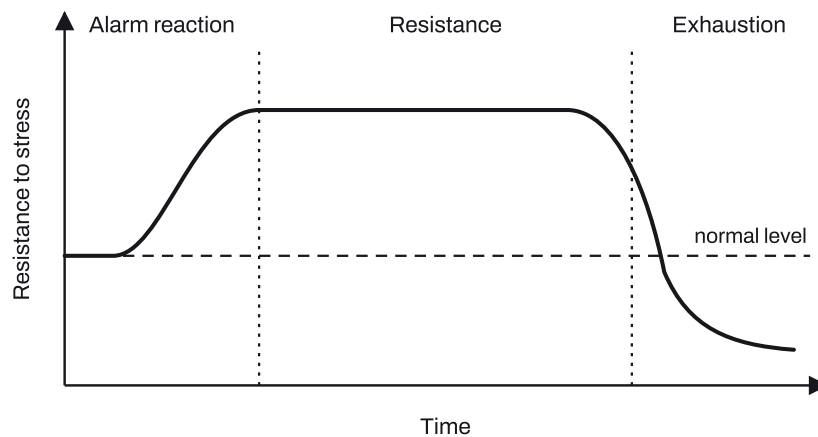
What happens in the body: fight or flight

Stress is what we feel when the demands on us (a **stressor**: a deadline, an illness, a crowded train) seem greater than our ability to cope. The body answers a stressor with the same reaction it uses for physical danger, the **fight or flight** response.

- The **sympathetic** branch of the **autonomic nervous system** acts fast: it speeds up the **heart rate** and **breathing** and raises **blood pressure**, and it signals the **endocrine system**.
- The **endocrine system** is slower and works through **hormones**. The **pituitary gland** releases **ACTH**, which makes the **adrenal cortex** release **cortisol**; the **adrenal medulla** releases **adrenaline**. Adrenaline and cortisol both push up heart rate and blood pressure and release energy.
- So the body is ready to run or fight: more energy, faster heart, faster breathing, tense muscles, more sweating. This is useful for a short physical danger, but a stressful job or a long illness does not end in a few minutes.

The GAS model

Selye (1936) found, from research with **rats**, that the body responds to any long-lasting stressor in the same three stages. He called it the **general adaptation syndrome** (GAS).



1. **Alarm reaction:** the stressor is noticed and the **fight or flight** response starts: adrenaline and cortisol are released, heart rate and breathing go up and energy is released to deal with the stressor.
2. **Resistance:** if the stressor goes on, the body tries to **adapt** to it. The body settles below its peak and begins repairs, yet it never fully stands down: it stays on **high alert**, draining its resources. A person in this stage often feels on edge: **irritability**, frustration and trouble with **concentration** are typical. Remove the stressor now and the body recovers without lasting damage.
3. **Exhaustion:** a stressor that never lets up uses up the body's reserves, and it can no longer resist. The person feels worn out (**fatigue**), may become anxious or depressed, and copes with even small stressors badly. This is when **stress-related illness** appears.

Effects of stress on health

The body cannot stay highly aroused for ever; in the exhaustion stage some part of the system breaks down.

- **Heart and circulation:** **high blood pressure** (hypertension) and narrowed arteries raise the risk of a **heart attack** (coronary heart disease, CHD) and a **stroke**.
- **Immune system:** a **weakened immune system**, so more infections and illness.
- **Others:** **headaches**, **insomnia**, changes to **appetite**, fatigue, raised blood sugar and **type 2 diabetes**, increased muscle tension, more sweating and a raised resting heart rate.

Each effect can then affect daily life: fatigue makes it hard to get to work on time and to concentrate; a weak immune system means time off sick; headaches make a person irritable.

Evaluating the GAS model:

- **Strength:** it explains why **long-term** (chronic) stress, not a brief scare, makes people ill, and shows when to step in (before exhaustion). It is backed by Selye's research and by the known hormones.
- **Reductionist:** it splits stress into three biological stages and misses the person's thoughts, feelings and situation, and how two stressors at once (a new job **and** a sick relative) can put someone in different stages for each.
- **Deterministic and nomothetic:** it says everyone goes through the same stages, so it does not explain **individual differences**: why some people exposed to the same stressor fall ill and others don't.

- **Animal research:** it came from rats, which may not generalise to people, whose stress often comes from thinking about a problem rather than physical danger.
- It does not separate **physical**, **emotional** and **mental** stressors.

Cause 1: life events (Holmes and Rahe, 1967)

Life events are big changes in a person's life that need them to **readjust**, such as the death of a spouse, divorce, losing a job or getting married. Both **negative** and **positive** events are stressful, because both change our routine.

Holmes and Rahe made the **Social Readjustment Rating Scale (SRRS)**:

- **394 participants** rated how much readjustment each of **43 life events** needs, against **marriage**, which was given the value **50**.
- Each event got a score in **life change units** (LCUs) from the mean ratings. Examples:

Life event	LCUs
Death of a spouse	100
Divorce	73
Marriage	50
Pregnancy	40
Business readjustment	39
Change in sleeping habits	16

- A person ticks the events that have happened to them in the **past 12 months** and **adds up** the scores. The **higher** the total, the more stress.
- People scoring **300 or more** LCUs in a year were more likely to suffer **illness**. Rahe also linked life event scores to later illness in **US sailors**.

Cause 2: work (Chandola et al., 2008)

Some jobs are more stressful than others: **high demands** (long hours, deadlines) with **low control** over the work, poor relationships at work, job insecurity and too few resources all add stress.

Chandola et al. (2008) studied work stress and heart disease.

- **Sample:** **10,308** London **civil servants**, **male and female**, aged **35 to 55** at the start.
- **Procedure:** a **longitudinal** study that started in **1985** and was completed in **2004**. Data came from **self-report postal questionnaires** about work stress and a **clinical examination** of biological risk factors (**CHD**, **blood pressure**, **cortisol**, **waist measurement**) and health behaviours (**diet**, **exercise**, **alcohol**, **smoking**).

- **Results:** chronic work stress was linked to **CHD**: the more work stress people reported, the more CHD. The link was **stronger in those under 50**. Work stress was linked to **lack of exercise** and **poor diet**, and about **32%** of the effect of work stress on CHD came through its effect on **health behaviours** and the **metabolic syndrome**.
- **Conclusion:** work stress is linked to heart disease, partly because stressed people live less healthily (less exercise, poorer diet).

Evaluating it:

- **Generalisations:** a huge sample (10,308) with both sexes and many kinds of job within the civil service; but all office workers from **one city** (London), so work stress in other jobs and **other cultures** may differ. Children and the elderly don't work, so not generalising to them is **not** a problem for a study of work stress.
- **Longitudinal:** follows the same people for about 19 years, so stress can be shown to come **before** illness; but people drop out (**attrition**).
- **Self-reports** of work stress may be affected by social desirability; the clinical measures are **objective**.
- **Application:** employers can cut stress by giving workers more control.

Cause 3: Type A personality (Friedman and Rosenman, 1974)

Friedman and Rosenman said that stress comes from a person's life events **and** their **personality**.

- **Type A** people are **competitive** and high-achieving, **time conscious** (always racing the clock, impatient with delays, doing several things at once, feeling guilty when relaxing), and **aggressive or hostile** (easily angered, assertive), and like to be in **control**.
- **Type B** people are **not competitive**, relaxed, patient, flexible and work more slowly.

Type As experience more events as stressful, so they are **aroused** more often and for longer; they work long hours and sleep poorly, which over time leads to **stress-related illness** such as **CHD**.

Their study: a **longitudinal** study of **3000 healthy men** aged **39 to 59**, whose personality type was assessed and who were followed up for about **8½ to 9 years**. Roughly half were Type A and half Type B. **More than twice as many** Type As developed CHD as Type Bs (about 70% of the CHD cases were Type A), and over **70%** of the **257 men who died** were Type A.

Evaluating it:

- **Androcentric:** only men, so it cannot be generalised to women.
- **Either/or:** people are put in one of two types, but personality is more complex and may change with time, mood and age.
- **Reductionist and correlational:** assumes Type A causes CHD, when CHD has other causes (diet, smoking, genes), and not all CHD is stress-related; later research suggests only the **hostility** part of Type A is a risk.
- **Cultural bias:** the traits come from Western ideas of personality.
- **Strengths:** a very large sample over many years, so good population validity for middle-aged men, and a clear **application**: Type As can learn to act more like Type Bs.

Measuring stress: an overview

Kind	Measures	Data	Main strength	Main weakness
Biological: recording devices	heart rate monitor, blood pressure (sphygmomanometer), GSR, ECG, fMRI	quantitative, objective	not open to the participant's bias; reliable on a standard scale	shows arousal, not its cause ; a high reading may not be stress
Biological: sample tests	salivary cortisol (also blood or urine)	quantitative, objective	cortisol is a stress hormone, so a direct measure	one sample is a snapshot; must be collected and analysed
Psychological: self-report questionnaires	Type A tests; the SRRS life events questionnaire	quantitative, subjective	asks how the person thinks and feels; cheap and quick	social desirability, poor recall; a score may not show how stressful events really were

Recording devices

These measure the body's **arousal**, which rises with stress.

- **Heart rate monitors** (including wearables such as smart watches): stress raises heart rate. A smart watch can also record **heart rate variability**, where a **high** score means the person is **more relaxed**.
- **Sphygmomanometer**: measures **blood pressure**, which is higher under stress.
- **Galvanic skin response (GSR)**: stress makes us sweat, and sweat makes the skin **conduct electricity** better; GSR measures this.
- **ECG** (electrocardiogram) records the heart's electrical activity; **EMG** records muscle activity.
- **fMRI** (functional magnetic resonance imaging) measures **brain activity** by detecting changes in **blood flow**. The person does a control task and then a stressful task inside the scanner, and the change in blood flow shows which brain areas respond to stress. It cannot be carried around, so it is no use for comparing stress at home and at work.

Wang et al. (2005): stress in the scanner

Aim: to find which brain areas respond to psychological stress, using **fMRI**.

Participants: **32** native English speakers, screened for any history of neurological or psychiatric illness: **25** in the stress condition and **7** controls; 2 were excluded for incomplete data.

Procedure: in the fMRI scanner, participants did two **mental arithmetic** tasks:

- a **low stress task**: counting **aloud backwards from 1000**;

- a **high stress task: serial subtraction of 13 from a four-digit number**, answering aloud, while being pushed to go **faster** and told to **start again** after a mistake.

To check (**validate**) that the tasks really caused stress, they used **four measures**: two **physiological** (**heart rate** and **salivary cortisol**) and two **self-reports** on a **1 to 9** scale: **stress and anxiety** before and after each task, and **effort, frustration and task difficulty** after the stress tasks.

Results: heart rate was **highest during the high stress task**, lower in the low stress task, lower at baseline than in either task, and lowest after the final scan; participants reported more negative emotion (mild to moderate) in the stress condition. The **ventral right prefrontal cortex** was found to play a key part in the brain's response to stress.

Conclusion: the right prefrontal cortex plays a key part in the brain's response to psychological stress.

Evaluating it: brain, heart and cortisol measures are **objective** and the self-reports check them (several measures make it more **valid** and less **reductionist**); but a small, carefully screened sample, and doing sums in a scanner is not everyday stress (low **ecological validity**).

Sample tests: salivary cortisol

Cortisol is released in stress, and some of it passes into **saliva**. The person dribbles or spits into a small tube (a **salivette**), and a laboratory measures the cortisol: more cortisol, more stress. Cortisol can also be measured in **blood** or **urine**, but saliva is the easiest and least invasive. With children, collection can be made into a game, or the child can clear their throat and spit into the tube just as adults do, with a parent's consent.

Evans and Wener (2007): crowding on the train

Aim: to see whether **crowding** on a commuter train causes stress.

Participants: **139** adult **commuters** (men and women) travelling to work by train.

Procedure: **saliva** was collected for **cortisol** at the end of the **morning commute** and again at **home at the weekend**, for comparison. **Mood** was rated on a **5-point semantic differential scale** during the commute; **motivation** was measured at the end by how long they **persisted** on a **proof-reading task**. Crowding was measured two ways: the **density** of the whole **carriage** (passengers in it) and **seat density** (passengers right around the participant).

Results: the density of the carriage did **not** affect stress, but **seat density** raised both **self-reported stress** and **salivary cortisol**.

Conclusion: it is people intruding on our **personal space** right around us, not a crowded train in general, that causes commuting stress.

Evaluating it: a **field** study of real commuters, so high ecological validity; cortisol is **objective** and was compared with the person's own home level; but only commuters on one kind of transport, and other things on the journey (delays, noise) were not controlled.

Psychological measures: questionnaires

Type A tests. There is **no single standard** test; Type A has been measured in many ways, with **forced-choice** questions, **Likert scales** and an **interview** (the **SI** assessment) that rates a person's verbal and non-verbal responses and expressive style. Examples:

- the **Jenkins Activity Survey (JAS)**, a questionnaire with **3 main categories: speed and impatience, job involvement and hard-driving competitiveness**;
- the **Framingham** Type A scale, which assesses time urgency, competitive drive and perceived job pressure;
- the **Bortner** short rating scale and a Finnish Type A scale.

Holmes and Rahe's life events questionnaire is the **SRRS** (above): tick the 43 events from the past year and add up the LCUs.

Evaluating questionnaires:

- **Quantitative** and **standardised**, so scores can be compared and analysed; quick, cheap and can be done privately, which may make people more **honest** than in an interview.
- **Social desirability** and **demand characteristics**: people may not admit events they find embarrassing (trouble with the law); they may **forget** events from months ago.
- **Subjective versus objective**: the SRRS gives every person the **same** score for an event, which is objective and easy to compare but ignores what the event **meant** to them: losing a job may be a relief to one person and a disaster to another. Type A tests ask for opinions, so they are more **subjective**.
- **Validity**: good face validity, but stress also comes from small **daily hassles**, not only big events, and forced-choice Type A items may not fit the person. **Reliability**: the SRRS is standardised; with so many Type A tests, their reliability is harder to judge.
- **Psychometrics**: a score is a reductionist summary of a person's experience.

Managing stress: biofeedback

Biofeedback is a psychological therapy in which a person learns to **control their own body's functions**.

1. A device records a **physical** sign of stress, such as **muscle tension, heart rate, blood pressure or skin conductance** (GSR).
2. It gives **immediate feedback**: a **tone** whose pitch rises with arousal, or a meter or screen.
3. The person uses **relaxation** (relaxing muscles, slowing breathing) and watches or hears the feedback fall, so they **learn** what works (the lower tone is a **reward**).
4. With practice they can relax this way without the machine, wherever they are.

It joins a **physiological** part (the reading) with a **psychological** part (learning to relax), so it is not reductionist. The equipment is simple: a small GSR unit bought once costs much less than years of tablets, and nothing like a brain scanner.

Budzynski et al. (1969): biofeedback for tension headaches

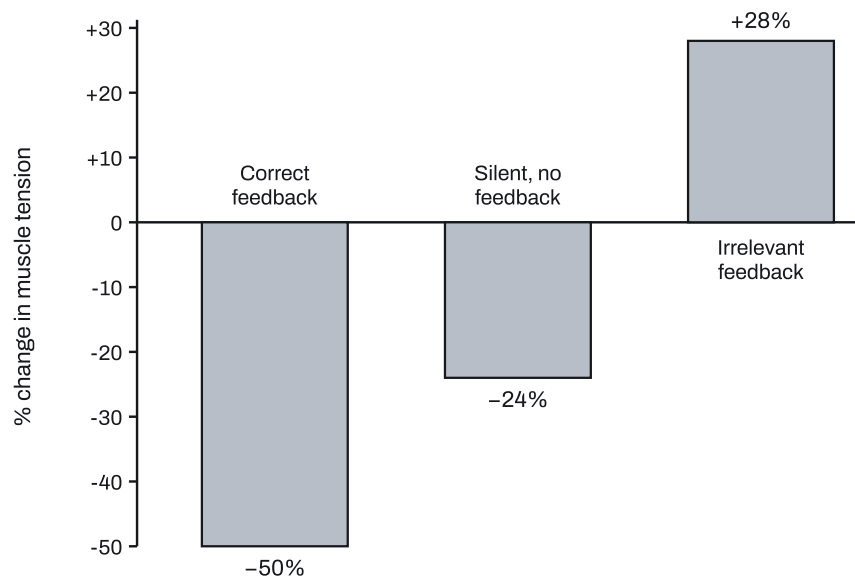
Participants: 15 people with **tension headaches**, **randomly allocated** to three conditions.

Procedure: all were connected to a device recording the tension of the **forehead muscle** and told to relax that muscle as deeply as possible.

- **Variable pitch (correct feedback):** the tone went up and down with the muscle's tension; they were told to keep it as low as possible.
- **Constant low tone (irrelevant feedback):** a steady, monotonous tone that they were told would help them relax.
- **Silent (no feedback):** no tone, just told to relax.

Mean muscle tension was measured over **five sessions**.

Results: only the correct feedback group had a **significant** fall in muscle tension.



On the graph of sessions, the correct feedback group started **high** and ended **lowest**; the constant low tone group started **lowest** and ended **highest**; the silent group stayed in the **middle**.

Conclusion: accurate feedback about the body helps people learn to relax and can reduce tension headaches.

Evaluating biofeedback:

- **Strengths:** the person **controls** it (free will), can use the skill **anywhere**, has no drug side effects or addiction, and the feedback itself is rewarding. Budzynski's two control groups and random allocation show the **feedback**, not just relaxing, made the difference.
- **Weaknesses:** it takes **time** and practice to learn; the person must be **active**, and some prefer a pill or a doctor treating them; it treats the **symptoms** (tension), not the cause of the stress. Budzynski's sample was **15** people with one condition, so it is hard to generalise.

Managing stress: relaxation and imagery

- **Relaxation**, such as **progressive muscle relaxation**: focusing on and relaxing one muscle group after another, with slow, deep breathing.
- **Imagery**: imagining a **peaceful scene** (a beach, a garden) or imagining feeling better, which deepens the relaxation and takes the mind off the stressor.

Both can be taught **before** a stressful treatment and used **before or during** it, so the stress response is calmer.

Key study: Bridge et al. (1988), relaxation and imagery during radiotherapy

Aim: to find out whether relaxation, and relaxation plus imagery, can reduce stress in patients being treated for **early breast cancer**.

Participants: **154 women** with early breast cancer, all **under 70**, all having **six weeks of radiotherapy** at the **Middlesex Hospital, London**. **139** completed the study. At the start, the groups' scores on the mood and depression and anxiety measures were the same.

Design: a **field experiment** with **random allocation** to three groups, an **independent measures** design (each woman was in **one** condition only):

Group	Women	What they did
Control	48	encouraged to talk about themselves ; no relaxation training
Relaxation	47	taught to relax by concentrating on individual muscle groups in turn, with diaphragmatic breathing to slow breathing and reduce tension
Relaxation plus imagery	44	the same relaxation, and taught to imagine a peaceful scene of her own choice to deepen the relaxation

Procedure: each woman saw the researchers **once a week for six weeks**, in sessions of about **30 minutes**. Both treatment groups were given a **tape recording** of the instructions and told to practise for **at least 15 minutes a day**. Mood was measured at the **start** and after **six weeks** (so it is **longitudinal**) with:

- the **profile of mood states (POMS)**, which gives a **total mood disturbance** score from six moods: **tension, depression, anger, fatigue, confusion and vigour**;
- the **Leeds general scales** for **depression** and **anxiety**.

Results:

- At six weeks, **total mood disturbance** was **significantly lower** in both treatment groups than in the control group, whose mood got **worse**.
- The **relaxation plus imagery** group were **more relaxed** than the relaxation only group. At six weeks the combined group's score was about **53.9**, against about 61 to 62 in the other groups.
- Women aged **55 and over** benefited most.

- There was **no difference** between the groups on the Leeds depression and anxiety scales.

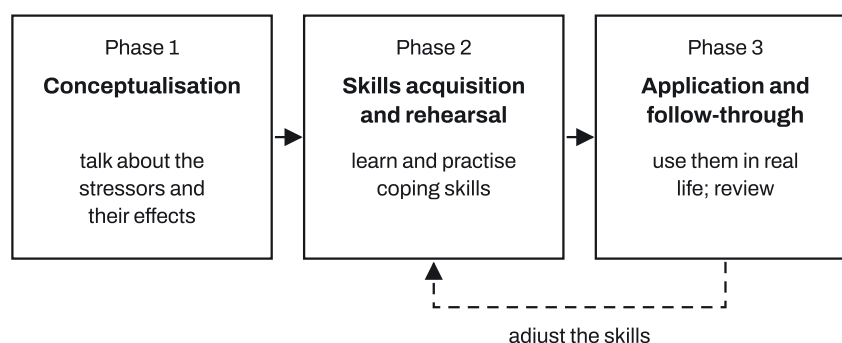
Conclusion: women with early breast cancer have better mood during radiotherapy if they are taught relaxation, and better still with imagery. (They measured mood, not "stress" directly.)

Evaluating it:

- **Field experiment:** real patients in a real hospital, with therapy like that any patient might receive, so good **ecological validity**; random allocation and a **standardised** treatment and the same measures for all give good control. But the women may have done other things to relax between sessions (extraneous variables), and they knew which group they were in, so they may have reported better mood because it was expected (**demand characteristics**).
- **Independent measures:** needed here; with **repeated measures** the relaxation learned in one condition would carry over into the next (order effects), and six-week treatments one after another would take so long that more women would drop out.
- **Generalisations:** a good-sized sample with a wide age range; but **only women**, with one illness, at one London hospital, so it may not apply to men, other illnesses or other cultures. A female sample does let a technique be **tailored** to women with this illness.
- **Self-reports:** POMS gives **quantitative** data that can be compared, but it is **subjective**.
- **Ethics:** informed consent; some women dropped out, showing the **right to withdraw**; the treatment groups benefited, but the control group was not offered the training.
- **Application:** a cheap, drug-free way to help patients cope with an unpleasant treatment. **Situational:** the therapy (the situation) improved mood. **Determinism and free will:** the training caused the change, but each woman chose to attend and practise.

Preventing stress: stress inoculation training (Meichenbaum, 1985)

Stress inoculation training (SIT) is a form of **cognitive behavioural therapy** that **prevents** stress: it prepares people to cope before stress builds up. Meichenbaum believed stress comes from thinking about events in **catastrophising**, negative ways, so SIT replaces those thoughts with positive **copng statements** ("I've prepared; one step at a time") and teaches relaxation.



1. **Conceptualisation:** the person and therapist discuss the **nature of the problem**: what the stressors are (deadlines, an exam), the negative thoughts behind them, and how stress affects the body.

2. **Skills acquisition and rehearsal:** the person **learns** and **practises** coping skills in the sessions: relaxation and breathing, **problem-solving**, positive self-statements, assertiveness.
3. **Application and follow-through:** the person **uses the skills in real situations** between sessions, through a series of stressful situations, and reviews with the therapist how it went, changing the plan where needed.

Evaluating SIT:

- **Strengths:** it **lasts**: the person keeps a set of skills after therapy ends; it gives a choice of strategies, so if one doesn't work another can be tried; it is **tailored** to each person's stressors; no drugs or side effects; fairly **holistic** (thoughts, body and behaviour).
- **Weaknesses:** it takes **time** and **commitment**, and costs money for many sessions; some people don't want to talk about private feelings; it ignores **biological** causes, so a person whose nervous system makes them more prone to stress may find it doesn't work; talking about stressors can itself be upsetting.

Issues and debates for this topic

Issue	How it applies here
Individual and situational explanations	Life events and work are situational; Type A personality is individual; Type As may choose stressful jobs, so the two interact.
Reductionism versus holism	The GAS model and a single heart rate reading reduce stress to one part; several measures together (Wang et al.), and SIT, are more holistic.
Determinism versus free will	The GAS model is biologically deterministic; biofeedback, imagery and SIT need the person to choose to practise.
Nature versus nurture	Fight or flight is inborn (nature); being alarmed by a deadline rather than a predator, and learned coping skills, are nurture.
Idiographic versus nomothetic	The SRRS and the GAS model are nomothetic (the same for everyone); SIT is tailored to the individual.
Questionnaires and psychometrics	Type A tests and the SRRS: quick, quantitative, standardised; open to social desirability and poor recall.
Subjective and objective data	Self-reports are subjective; heart rate, GSR and cortisol are objective but don't show what the person feels or what caused it.
Validity and reliability	Physiological devices measure on a standard scale (reliable); a reading may be high for another reason (low validity), so self-reports are used to check them.
Generalisations from findings	Men only (Friedman and Rosenman); women only (Bridge et al.); London civil servants (Chandola et al.); 15 people (Budzynski et al.).
Application to everyday life	Biofeedback, imagery and SIT can be used anywhere; employers can give staff more control.

Issue	How it applies here
Ethics	Control groups miss the benefit; SIT asks people to face stressors; collecting saliva from children needs consent.

Older syllabus content (2021–2023 questions only)

Medical (biochemical) techniques for managing stress:

- **Benzodiazepines** (BZs) act as **sedatives**: they increase the effect of the brain chemical **GABA**, which reduces brain activity, giving reduced anxiety and muscle relaxation.
- **SSRIs** (antidepressants such as fluoxetine, Prozac) make more **serotonin** available at the synapse, stabilising mood.
- **Beta-blockers** block the effects of **adrenaline**, so blood pressure falls and the heart beats more slowly.

They work fast and need no effort, but they treat symptoms, not causes, can have side effects and can be **addictive**; the patient is **passive**.

Key facts and formulas

There is no formula list in the 9990 exam. "Learn it" means you must remember it.

Fact	Status
Fight or flight: sympathetic nervous system raises heart rate, breathing and blood pressure; pituitary releases ACTH, adrenal cortex releases cortisol, adrenal medulla releases adrenaline	Learn it
GAS model (Selye, 1936): alarm reaction, then resistance, then exhaustion; illness appears in exhaustion	Learn it
Effects of stress on health: high blood pressure, heart attack (CHD) and stroke, weakened immune system, headaches, insomnia, fatigue, appetite changes, type 2 diabetes	Learn it
SRRS (Holmes and Rahe, 1967): 43 life events scored in life change units, marriage = 50, death of a spouse = 100; add up the past 12 months; 300 or more linked to illness	Learn it
Chandola et al. (2008): 10,308 London civil servants, male and female, aged 35–55, 1985 to 2004; work stress linked to CHD, more so under 50	Learn it
Type A (Friedman and Rosenman, 1974): competitive, time conscious, aggressive or hostile; 3000 healthy men aged 39–59; over 70% of the 257 deaths were Type A	Learn it
Wang et al. (2005): fMRI; low stress = counting aloud backwards from 1000; high stress = serial subtraction of 13 from a four-digit number; validated with heart rate, salivary cortisol and 1–9 self-ratings	Learn it
Evans and Wener (2007): 139 commuters; salivary cortisol after the morning commute and at home at the weekend; seat density, not carriage density, raised stress	Learn it

Fact	Status
Jenkins Activity Survey: 3 categories, speed and impatience, job involvement, hard-driving competitiveness	Learn it
Budzynski et al. (1969): 15 tension headache sufferers; correct feedback, irrelevant (constant low tone) feedback, silent; muscle tension fell 50%, rose 28%, fell 24%	Learn it
Bridge et al. (1988): 154 women with early breast cancer (139 completed), six weeks of radiotherapy; control 48, relaxation 47, relaxation plus imagery 44; POMS and Leeds scales; mood best with relaxation plus imagery	Learn it
Stress inoculation training (Meichenbaum, 1985): conceptualisation, skills acquisition and rehearsal, application and follow-through	Learn it

How to do it

We have tagged 37 questions on this topic, from 2021 to 2026 (Papers 3 and 4; 29 different questions, as variants repeat them). 15 of them have parts of more than one type, so the counts add up to 61.

Question type	Questions
Evaluate a theory, measure, technique or study	11
Outline or explain a stress concept	9
Describe and evaluate essay	8
Apply knowledge to a scenario	7
Describe a named study	7
Methodology and data from a key study	6
Plan a study and justify it	5
Discuss strengths and weaknesses with a conclusion	3
To what extent essay	3
Outline an issue or debate and apply it	2

1. Evaluate a theory, measure, technique or study (11 questions)

Usually one or two strengths or weaknesses, 2 marks each: the point (1), then **applied** to this theory, measure or study, or to the person in the question (1). Make two points genuinely different.

1. Name the point: "it is reductionist", "it does not show the source of stress", "only women were studied".
2. Say **why** it matters **here**, with a detail: "so Nadim's cortisol on a day his boss is away would wrongly suggest he isn't stressed at work".

Variations you will meet:

- **A weakness of the GAS model:** reductionist (two stressors may put a person in different stages at once), deterministic, ignores individual differences, does not separate physical, emotional and mental stressors.
- **A weakness of a biological measure:** shows that stress may be present but not its **source**; a high reading may have another cause (high blood pressure from lack of fitness); the **white coat effect** (blood pressure rises at the doctor's); one reading is a **snapshot**; the person may forget to take readings.
- **Strengths of a biological measure** (salivary cortisol): **objective**, so not open to the person's bias; **reliable**, the same test on everyone gives accurate numbers; **valid**, as cortisol is a stress hormone.
- **Weaknesses of Friedman and Rosenman** (6 marks, levels): two weaknesses each explained in detail for 5–6 marks: men only; either/or types; CHD may have other causes; only hostility may matter; Western traits.
- **Strength and weakness of SIT** (6 marks, levels): lasting skills, tailored, no drugs; versus time, cost, commitment, not wanting to talk, ignores biology. "Ecological validity" and "self-reports" are not strengths or weaknesses of a therapy.
- **Bridge et al.:** a problem with **repeated measures** (relaxation learned in one condition carries over and makes the next pointless; longer treatment, more drop-outs, too few left to judge); strength and weakness of a **female sample** (techniques tailored to women with this illness; but men would need different techniques, and the findings may not apply to men's illnesses).
- **Generalisability of Chandola et al.** (6, levels): large sample with many jobs, both sexes; but London civil servants only, office work, one culture.

2. Outline or explain a stress concept (9 questions)

Short recall, 1 or 2 marks a point: name it (1), then explain or give an example (1).

- **Two physical effects in the exhaustion stage:** fatigue, weakened immune system, headaches, high blood pressure, appetite changes, raised resting heart rate, raised blood sugar, muscle tension, sweating. One mark each; they must be **physical** (not anxiety).
- **A physiological effect on health** [2]: name the illness and **why**: "continued high blood pressure (1) can lead to a stroke (1)". Describing the GAS model alone scores 0.
- **Two Type A characteristics** [4]: competitive, time conscious, aggressive/hostile, each with an explanation ("time conscious: struggles against the clock, impatient with delays").
- **Why Type As get stress-related illness** [2]: the trait **and** why it leads to illness: "competitive and controlling, so they work long hours and sleep poorly (1), keeping them aroused and more likely to develop CHD (1)".
- **Causes other than personality** [4]: life events with Holmes and Rahe's SRRS detail; work with Chandola et al.'s findings or high demand and low control. "A levels are stressful" with no psychology is anecdotal.
- **Recording devices** [2]: fMRI, sphygmomanometer, GSR, heart rate monitor, ECG (EMG and PET also credited). **Not** urine, which is a sample test.
- **Why heart rate rises with stress** [2]: the pituitary releases ACTH; the adrenal medulla releases adrenaline (and the cortex cortisol), which raise heart rate.
- **What biofeedback is** [2]: physiological **and** psychological parts: "a GSR reading shown as a tone (1); by relaxing, the person learns to lower it (1)".

- **Two techniques other than biofeedback** [4]: relaxation and imagery (Bridge et al.); SIT (Meichenbaum); (older) a drug such as an SSRI.

3. Describe and evaluate essay (8 questions)

Paper 3 Section C (Section B before 2024): (a) **describe** [6] (8 before 2024), (b) **evaluate** [10] with a **named issue**.

1. **(a):** cover **every** part named; if two areas are named (Type A tests **and** the SRRS; biofeedback **and** SIT), describing only one caps (a) at 4. Give studies in detail: sample, procedure, measures, results. For Bridge et al., full marks need the sample, **all three conditions**, the procedure and a result: "reduced stress" is not credited, as they measured **mood**.
2. **(b):** start with the **named issue** (field experiments, questionnaires, determinism versus free will, experiments, nature versus nurture, validity), applied to each thing from (a); then several more issues, each with a reason and an example; then a judgement. Listing issues, or naming one ("this is reductionist") without explaining it, stays in Level 1.
3. **Stay on the subtopic:** in "sources of stress", the GAS model needs its three stages and links to illness, not just fight or flight; anecdotes about exams earn nothing.

4. Apply knowledge to a scenario (7 questions)

A named person with a stress problem. Every mark needs a point from the topic **and** the person's details.

1. Pick the right knowledge: relaxation and imagery for a stressful medical treatment; GAS stages for symptoms; SIT's three phases for worries; biological measures for comparing places.
2. Give **how** it works, not just its name: "progressive muscle relaxation, relaxing each muscle group in turn", not "he could relax".
3. Tie each step to the scenario: Isha's **deadlines**, Lydia's **new job and sick relative**, Rajeesh's **treatment**.

Variations you will meet:

- **Relaxation and imagery** [4] (2 + 2): teach them **before** treatment; progressive muscle relaxation used before or during it; imagery of a **peaceful scene** or of feeling better.
- **GAS model and symptoms** [4]: alarm (extra energy for the new demands), resistance (stressors continue, so irritability), exhaustion (tiredness and anxiety).
- **SIT for work stress** [4]: one mark per phase and one for the link; without the person's **specific** worries (deadlines, quality of work) the mark is capped at 3.
- **Effect of a physical symptom at work** [2]: fatigue, so late for work and poor concentration; weak immune system, so time off sick.
- **Two biological measures, home versus work** [4]: each one named and what the result would show: "saliva samples at work and at home; cortisol rises with stress, so higher at work". Not fMRI: it can't be used at home or work. Cortisol from blood, urine or saliva each counts.
- **Saliva from children, ethically** [2]: spit into a salivette as adults do, make it a game, clear the throat first; with parental consent.

5. Describe a named study (7 questions)

Short (2 to 4 marks) recall: **sample, procedure, measures, result.**

- **Bridge et al., the relaxation plus imagery group** [2]: relaxation of individual muscle groups with diaphragmatic breathing (shared by both treatment groups) (1) **plus** imagining a peaceful scene of her own choice (1).
- **Evans and Wener** [2]: 139 commuters; saliva for cortisol at the end of the morning train journey and at home at the weekend.
- **Friedman and Rosenman** [4]: 3000 healthy men aged 39 to 59, personality type assessed, followed up for about 9 years; full marks need **Type A and B** and the **result** that Type As were more likely to get CHD or die.
- **Wang et al.'s two tasks** [2]: counting aloud backwards from 1000; serial subtraction of 13 from a four-digit number under time pressure. "A high stress and a low stress task" repeats the question and scores 0.
- **Chandola et al.** [4]: 10,308 London civil servants, male **and** female; questionnaires and clinical data; work stress linked to CHD, more so under 50; 32% of the effect through health behaviour and the metabolic syndrome. A vague result ("stress causes illness") misses a mark.

6. Methodology and data from a key study (6 questions)

Paper 4 Section A. Use the **study's** details, not general points.

- **Bridge et al.'s design** [2]: **independent measures**: each woman was in only one condition.
- **Why Bridge et al. is longitudinal** [2]: it lasted **six weeks**, with mood measured at the start and again after six weeks.
- **Compare total mood disturbance for two groups** [2]: a statement (1) **plus** numbers (1): "the combined group scored lower (about 53.9) than the others (about 61 to 62)". "Initial" and "six weeks" are not groups.
- **How to graph it** [2]: a **bar chart** with a bar for each group at the start and at six weeks (not a histogram: the groups are not a continuous scale).
- **Strengths of a longitudinal study here** [4]: change in the **same** person over time; participant variables stay constant; the same measures (POMS, Leeds) used at both times show reliability. Apply each to Bridge et al.
- **Findings from a graph** [2 or 4]: describe the pattern **with numbers**: Budzynski's correct feedback group started highest and ended lowest; Wang et al.'s heart rate was highest in the high stress task.
- **Wang et al.'s non-physiological measures**: the 1 to 9 self-ratings of stress and anxiety (before and after each task) and of effort, frustration and difficulty (after); "questionnaires" scores 0.

7. Plan a study and justify it (5 questions)

Paper 4 Section B, with the research methods topic (see that note for methods). The stress part is the **psychological knowledge** behind the plan.

- **Since 2024** [24]: (a) a plan [10] with the named method and the two named features (experimental design and DV; interview technique and types of data); (b)(i) **describe** the knowledge it rests on [4]: Budzynski et al. for biofeedback (15 headache sufferers, three groups, feedback group's tension fell 50%), or SIT's three phases for prevention; (b)(ii) **two features** of that knowledge and how each shaped your plan [2 + 2]: "Budzynski used a tone that rose with tension, so my students get a GSR tone"; (c) three 2-mark reasons or weaknesses of **your own** choices, applied to the plan.
- **Before 2024** [18]: a design [10] and its psychological **and** methodological evidence [8]; only one kind caps it at 5.
- **Use the right knowledge**: for **preventing** stress use SIT, not Budzynski or Bridge, who **treated** people already stressed. Answer the comparison asked (women versus men).
- **Good choices**: an **independent** design with random allocation to biofeedback or no biofeedback (repeated measures would carry learning over); a DV of **GSR** or **salivary cortisol** (quantitative, objective, as Evans and Wener used) or a 1 to 10 stress rating; for an interview on SIT, after the follow-through phase, a closed rating ("excellent, good, not good, useless") plus an open "why?".

8. Discuss strengths and weaknesses with a conclusion (3 questions)

Paper 4 [5] (2021–2023): 1 mark per strength or weakness **related to the question**, up to 4 (at least two of each side; unrelated, generic points max 2), plus 1 for a **conclusion**: a decision reached by reasoning, not a summary.

- **Longitudinal studies to measure stress**: change in the same people; constant participant variables; test-retest reliability; versus **attrition**, variables can't be changed once started, unforeseen events.
- **Biofeedback**: self-controlled, usable anywhere, rewarding feedback; versus some prefer a doctor or a pill, need to be active, takes time.
- **Physiological measures to validate Wang et al.'s tasks**: objective, reliable on a standard scale, the same in every culture; versus ignore what the person feels, only correlational, one measure is reductionist (which is why Wang also used self-ratings).

9. To what extent essay (3 questions)

Paper 4 [12] (2021–2023), levels-marked. Argue **both sides** of the statement with named research, then a reasoned judgement. Description of studies only counts when it supports an argument.

- **"Psychological techniques are more effective than medical ones"**: for: the person is active, no addiction, usable anywhere (Budzynski, Bridge); against: drugs are quick and need no time-consuming practice, and they relieve symptoms.
- **"Psychological measures are more valid and reliable than physiological ones"**: for: the person can explain their stress, physiological data is only correlational and a single measure is reductionist; against: physiological data is objective and reliable on a standard scale (a sphygmomanometer) and universal across cultures.

- **"Life events measures are too subjective to be of any use"**: discuss the **debate**, not just the SRRS: socially desirable answers, ignores physiology, culture-bound; but gives comparable numbers, can validate physiological measures (as in Wang et al.) and targets specific causes.

10. Outline an issue or debate and apply it (2 questions)

(a) define **both** sides (1 + 1); (b) apply it: the point (1) and a linked detail (1).

- **Reductionism versus holism**: whether behaviour is best understood by breaking it into parts (reductionism) or by looking at the whole person (holism). Not "only one type of explanation".
- **A heart rate monitor is reductionist**: it measures **one** physical sign only (1); heart rate can rise for other reasons, and it misses other changes such as cortisol and psychological signs such as racing thoughts (1). Talk about the **measure**, not the source of stress.
- **Determinism versus free will**: whether behaviour is caused by internal or external forces (determinism) or is within the person's own control (free will).
- **Why free will matters for biofeedback**: the person chooses to respond to the feedback (1) and learns to relax their muscles or slow their breathing to lower the tone (1).

Worked examples

Example 1

Tomas is a trainee nurse. He becomes very anxious before every practical assessment and keeps thinking "I will make a mistake in front of everyone".

(a) Suggest how stress inoculation training could help to reduce Tomas's stress about his assessments. **[4]**

(b) Explain **one** weakness of stress inoculation training as a way to prevent Tomas's stress. **[2]**

(a) SIT could prevent Tomas's stress by building up his coping skills before the assessments **(B1)**. First, in the conceptualisation phase, the therapist would talk with Tomas about his assessments and his catastrophising thought that he will make a mistake in front of everyone, and how this makes his body tense **(B1)**. Next, in skills acquisition and rehearsal, he would learn and practise slow breathing and a coping statement such as "I have practised this; one step at a time" for the start of an assessment **(B1)**. Finally, in application and follow-through, he would use these skills in practice sessions on the ward and then in a real assessment, and review with the therapist what worked **(B1)**.

(b) It needs time and commitment **(B1)**: Tomas would have to attend several sessions and practise between them while also working shifts and studying, so he may give up before the application phase and not gain the skills **(B1)**.

Example 2

A psychologist recruited 40 university students who said they felt stressed before exams and randomly allocated them to two groups of 20. The biofeedback group wore a GSR device on two fingers that played a tone rising in pitch as skin conductance rose, and practised relaxing for 20 minutes a day for four weeks. The control group wore the same device for the same time, but its tone was switched off. The mean skin conductance score of the biofeedback group fell from 12.0 to 7.5; that of the control group fell from 12.4 to 11.8.

- (a) Describe how the GSR device could help a student in the biofeedback group to reduce their stress. **[2]**
- (b) Calculate the percentage fall in mean skin conductance for each group, to 1 decimal place, and state what the comparison shows. **[4]**
- (c) Suggest **one** reason why the control group wore a device with no tone, rather than no device at all. **[2]**
- (a)** The tone rises when the student's skin conducts more (sweating from arousal), so they hear straight away how stressed their body is (**B1**); as they slow their breathing and relax their muscles they hear the tone fall, learn which actions lower their arousal, and can later use them in the exam hall without the device (**B1**).
- (b)** Biofeedback group: $\frac{12.0-7.5}{12.0} \times 100 = 37.5\%$ fall (**M1 A1**). Control group: $\frac{12.4-11.8}{12.4} \times 100 = 4.8\%$ fall (**A1**). The fall was about 32.7 percentage points larger with the tone, so hearing feedback, not just sitting still with a device, reduced the students' arousal (**B1**).
- (c)** It controls for the experience of being wired up and taking time out to sit quietly (**B1**): both groups had the same device and time, so the bigger fall in the biofeedback group can be put down to the tone's information rather than to rest or to expecting the device to help (**B1**).

Example 3

- (a) Describe biological measures of stress. **[6]**
- (b) Evaluate biological measures of stress, including a discussion of subjective and objective data. **[10]**
- (a) Recording devices.** Heart rate monitors (including smart watches) record the faster heart rate that stress brings; a sphygmomanometer measures raised blood pressure; GSR measures how well the skin conducts electricity, which rises with stress-related sweating. fMRI measures brain activity through changes in blood flow while a person does a stressful task. Wang et al. (2005) put 32 participants in an fMRI scanner for a low stress task (counting aloud backwards from 1000) and a high stress task (serial subtraction of 13 from a four-digit number, pushed to go faster). Heart rate was highest in the high stress task, and the ventral right prefrontal cortex was found to play a key part in the stress response.

Sample tests. Cortisol, a stress hormone, passes into saliva, so a salivette sample can be tested in a laboratory. Evans and Wener (2007) took saliva from 139 commuters after the morning train journey and at home at the weekend; cortisol and self-reported stress were higher when seat density around them was high, though carriage density had no effect.

Why it reaches the top level: both kinds of measure, how each detects stress, and two studies with sample, procedure and results.

(b) Subjective and objective data (the named issue). Heart rate, GSR and cortisol are objective: they are recorded on a standard scale and are not open to the person's wish to look calm, unlike a questionnaire. But they say nothing about what the person feels or what is causing the stress. A heart rate monitor on a commuter cannot tell whether the train or an argument at home is the stressor. That is why Wang et al. also used subjective 1 to 9 self-ratings to check their tasks.

Validity. A high reading may have another cause: blood pressure can be high from lack of fitness, and heart rate rises with exercise. So a biological measure alone may lack validity unless the situation is controlled.

Reductionism. One measure, such as heart rate, reduces stress to a single sign; using several measures together, as Wang et al. did, is more holistic.

Reliability and generalisations. Devices give consistent readings, and physiology is the same in every culture, so findings generalise well; but a single sample is a snapshot, and Wang et al.'s small, screened sample doing sums in a scanner is far from everyday stress.

Application. Wearables and salivettes can be used at home and at work, so a doctor can compare the two; fMRI cannot be carried around and is expensive.

Overall, biological measures are the most objective way to show that stress is present, but they are most useful alongside a subjective self-report that shows what the stress means to the person.

Why it reaches the top level: the named issue first, applied to the measures from (a) with examples; further issues explained; a reasoned judgement.

Common mistakes

- **Stomach ulcers** as a physical effect of stress were **not** credited in 2025; nor were **psychological** effects (anxiety) when physical ones were asked (March 2025 report).
- **Describing the GAS model** when an effect on health is asked scores 0 (June 2023 report); in an essay, fight or flight alone, without the three stages and the link to illness, stays low (November 2022 report).
- **Type A without the link:** naming "competitive" but not explaining why it leads to stress-related illness earns only 1 of 2 (June 2022 report).
- **Chandola et al.:** saying the sample was all men (it was male and female); a vague result; saying it can't be generalised to children or the elderly, who don't work (June 2021 report).
- **Biochemical techniques** (older): giving a psychological technique, or naming a drug without how it reduces stress (June 2021 report).
- **Biofeedback misunderstood:** it does not use an expensive scanner, the tone is not harmful, and it is not reductionist, as it has physiological and cognitive parts (June 2022 report).
- **Wang et al.'s tasks:** writing "a high and a low stress task" instead of what the tasks were; calling the self-ratings "questionnaires" (November 2021 report).

- **Not linking to the person:** naming relaxation or imagery without how it is done or how it helps Rajeesh's treatment (March 2026 report).
- **Reductionism:** defining it as "one type of explanation", or discussing the source of stress instead of the heart rate monitor (March 2026 report).
- **Conclusions that are summaries,** and generic points about longitudinal studies not tied to stress (June 2023 and November 2021 reports).
- **Prevention plans using treatment studies:** Budzynski and Bridge treat people already stressed; prevention means SIT (June 2023 report).
- **"To what extent" answers that only describe** studies, or describe the SRRS without debating subjectivity (March 2023 and November 2021 reports).
- **Generic SIT evaluation** such as "ecological validity" or "self-reports" (June 2022 report).

How to get the marks

- **"Identify":** one exact term each: "sphygmomanometer", "time conscious".
- **"Outline", "explain what is meant by":** the idea plus a detail or example; 2 marks need both.
- **"Suggest"** in a scenario: the technique or measure, **how** it works, and the person's own details in every sentence.
- **"Explain" a strength or weakness:** the point (1), then why it matters for this study, measure or person (1).
- **"Describe" a study:** sample, procedure, measures, results; numbers make results specific.
- **Data questions:** a statement plus figures from the study or graph.
- **Essays:** (a) every part the question names; (b) the named issue first, applied to (a), then other issues explained, then a judgement.
- **"Discuss ... include a conclusion" and "to what extent":** both sides tied to the question, then a decision reached by reasoning, not a summary.
- **Plans:** the named method and features; knowledge from this topic that you actually **use**; reasons tied to your own plan.

Quick check

1. Put the three stages of the GAS model in order and give one sign of the last stage.
2. In the past 12 months, Ana got married, became pregnant and changed her sleeping habits. Using the SRRS values in this note, what is her score, and is it above the 300 LCU level linked to illness?
3. In Bridge et al. (1988), 154 women took part and 139 completed the study. How many dropped out, and what percentage is that, to 1 decimal place?
4. Sort these into biological and psychological measures: salivary cortisol, the Jenkins Activity Survey, GSR, the SRRS, fMRI.
5. Name the three phases of stress inoculation training in order.

Answers

1. **Alarm reaction, resistance, exhaustion**; a sign of exhaustion: fatigue (or anxiety, depression, illness such as high blood pressure).
2. $50 + 40 + 16 = 106$ LCUs: well **below** 300.
3. $154 - 139 = 15$ women; $\frac{15}{154} \times 100 = 9.7\%$.
4. **Biological**: salivary cortisol, GSR, fMRI. **Psychological**: the Jenkins Activity Survey, the SRRS.
5. **Conceptualisation**; **skills acquisition and rehearsal**; **application and follow-through**.

Past questions to try

- 9990/42/M/J/24 Q6: Evans and Wener's procedure, collecting saliva from children ethically, strengths of biological measures.
- 9990/33/O/N/24 Q11: two biological measures to compare stress at home and at work, and a weakness of one.
- 9990/43/M/J/24 Q5: why Bridge et al. is longitudinal, comparing groups' mood scores, graphing them.
- 9990/32/F/M/24 Q12: essay on biofeedback and stress inoculation training, with determinism versus free will.