

Organisational work conditions A2

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What you need to know

Organisational work conditions is the fourth topic of the Organisational psychology option (Papers 3 and 4). It has three parts. You should be able to describe, apply and evaluate:

1. Physical work conditions

- how **physical conditions** at work (lighting, noise, temperature and so on) affect **productivity**, and the **Hawthorne effect**, using a source such as **Kompier (2006)**;
- how the **design of the work environment** affects workers, focusing on **open plan offices**, with a study such as **Oldham and Brass (1979)**.

2. Temporal conditions of work environments (temporal means "to do with time")

- how work hours are designed: **shiftwork** with **rapid rotation** and **slow rotation**, **on-call** work and **flexitime**, with a definition and an example of each;
- how **shiftwork affects health and accidents**, with a study such as **Gold et al. (1992)**.

3. Health and safety

- **accidents at work** caused by **human errors** (errors of **omission**, **commission**, **sequencing** and **timing**) and by **system errors** in operator-machine systems (the machine's **controls** and **displays**);
- **reducing accidents** with a **token economy**, with a study such as **Fox et al. (1987)**;
- **monitoring accidents and risk events**, through the key study **Swat (1997)**.

4. The issues the syllabus lists for this topic: determinism versus free will, experiments, questionnaires, longitudinal studies, quantitative and qualitative data, application to everyday life, validity, individual and situational explanations, idiographic versus nomothetic, objective and subjective data, and generalisations from findings.

Swat (1997) is the only **key study**, so its details can be asked directly. The others are "e.g." studies: an alternative must cover the same content (for open plan, another study of a move into one).

Understand it

Physical work conditions and productivity

Physical conditions are the measurable surroundings: lighting, noise, temperature, humidity, layout.

Psychological conditions are things like recognition, satisfaction or bullying; asked for one of each, two physical ones don't score. Most physical conditions have a **best level** in the middle (not too dark or too bright, not too quiet or too loud), so a study usually compares several levels.

The Hawthorne studies and the Hawthorne effect

In the 1920s, researchers at the Hawthorne Plant of the Western Electric Company in Chicago tried to find which physical conditions could be changed to raise output. The first phase looked at **lighting (illumination)**.

- **IV:** for the experimental group the lighting was **lowered in steps**; a control group worked under **unchanged** lighting.
- **DV: productivity**, the output of tasks such as **inspecting parts, assembling relays and winding coils**.
- **Result:** output rose slowly in **both** groups, even as the lights dimmed. Later phases changed other things (rest breaks, how work was organised) and output tended to rise whatever was done.

The explanation was the **Hawthorne effect**: people change their behaviour because they **know they are being studied** and are getting special attention; the test-room workers had a special position and better relationships with each other and with management.

Later reviewers offered **other explanations** for the rise: **relief from harsh supervision**; **positive attention** and privileges from a friendly observer; **better relationships** with management; a say in **how the work was done**; **rest pauses**; **higher pay** linked to the group's output; **fear of losing the job** in the economic depression; or the **lighting changes** themselves.

Reviews of the Hawthorne studies have also noted that later research has not found the same results. The syllabus names Kompier (2006) as an example source here; older mark schemes credit the review by Wikstrom and Bendix (2000).

Evaluation. A **field experiment** in a real factory has high ecological validity, but the test-room workers were moved to a separate area and given extra attention, which may itself explain the result. Changing only lighting is **reductionist**: clear about cause, but blind to how pay, supervision and relationships act together (**holism**). And the studies are about 100 years old (**temporal validity**).

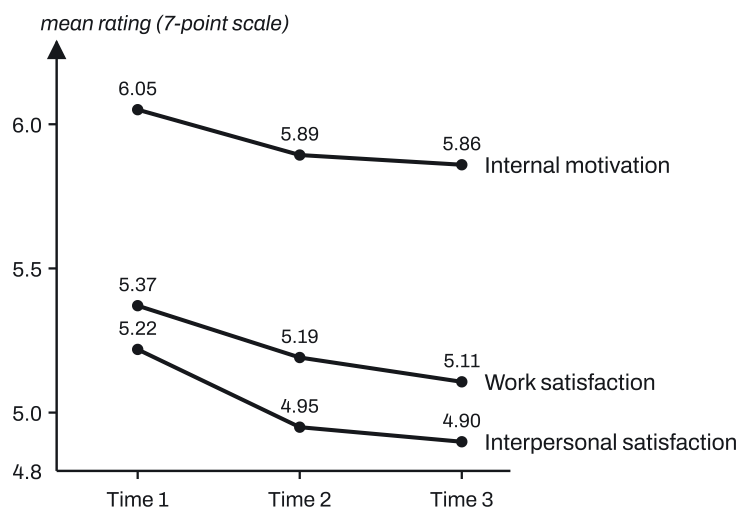
Open plan offices: Oldham and Brass (1979)

An **open plan office** is one large open space with **no interior walls or floor-to-ceiling partitions** and **no private offices**; at most there are low dividers at desk or head height, so there is nowhere private.

Oldham and Brass (1979) followed employees of a **newspaper in the Midwest of the USA** (a little over 120 people) whose company moved them from a **traditional office into an open plan office**. The newspaper, not the researchers, decided on the move.

- **Design:** a **longitudinal** study with **three waves** of measurement: a **baseline before the move** and two more **after** it. Most employees (76) took part in all three waves; **5** whose office did not change acted as a **control group**; others took part in two waves.
- **Questionnaires:** closed items rated on **7-point scales**. Three items measured each of five **job characteristics** (from Hackman and Oldham): **autonomy, skill variety, task identity, task significance and feedback**. Other items asked how easy it was to talk to others, how much conflict there was, how well they could concentrate, and how satisfied they were with their work and colleagues.
- **Interviews:** employees also described the new office in their own words.

Findings. Every measure in the figure below fell after the move. Mean ratings went down across the three waves for **work satisfaction** (5.37, 5.19, 5.11), **interpersonal satisfaction** (5.22, 4.95, 4.90) and **internal motivation** (6.05, 5.89, 5.86). Interpersonal satisfaction fell the most, by 0.32. In the interviews, staff compared the new office to a **"fishbowl"**, a **"cage"** or a **"warehouse"**: being on show all day left them unable to **focus**, slowed down **getting tasks done**, made **friendships** harder to build, and meant nothing could be said **in private**, whether to a co-worker or to a boss.



Note that **productivity was not measured**. Examiners report that many students wrongly say it was.

Why open plan can hurt concentration: there is more **background noise**, more **movement** of people walking past, more **interruptions**, and no private space. Workers can adapt, though: some put up their own barriers or wear headphones.

Strengths: ratings can be compared across waves while interviews explain the feelings behind them; the same people were measured before and after; the move was real (ecological validity); answers were kept confidential, and the company, not the researchers, made the move.

Weaknesses: one newspaper in one US city, without part-time or supervisory staff (**generalisation**); a control group of only 5; staff who disliked the office may have left before later waves; named questionnaires invite **socially desirable** answers; no follow-up beyond a few months; and 1979 offices differ from today's (**temporal validity**).

Moving the other way (open plan to private offices): more **autonomy** and **internal motivation**, feeling **less watched**, better **concentration** and easier **private feedback**; but **less communication** between people and departments and a weaker team feeling. Either direction earns marks if each effect is explained.

Temporal conditions: designing work hours

Temporal conditions are the **time** side of work: when and for how long people work. A standard 9 am to 5 pm day is common largely by convention and because it fits school hours; the syllabus asks you to define, and give examples of, the alternatives below.

Shiftwork means the work goes on round the clock in **shifts**, and a worker's shift changes from one period to the next. Typical shifts: **early** 6 am–2 pm, **late** 2 pm–10 pm and **night** 10 pm–6 am. Pheasant described two ways of organising the changes.

- **Rapid rotation:** the shift changes **every few days**.
 - **Metropolitan rota:** 2 earlies, 2 lates, 2 nights, then 2 rest days, and repeat. The cycle is 8 days, and the pattern is always "two of each".
 - **Continental rota:** 2 earlies, 2 lates, 3 nights, 2 rest days, then 2 earlies, 3 lates, 2 nights, then more rest; the blocks are a mix of twos and threes, so it is less regular, and it gives a longer weekend off now and then.
- **Slow rotation:** the shift changes only **every few weeks**, for example nights for about 3–4 weeks, a few days off, then days for 3–4 weeks.

The argument for **slow rotation** is biological. Our **circadian rhythms** (the body's 24-hour cycle of sleep and wakefulness) take days to adjust to a new shift. With rapid rotation the body never catches up; with slow rotation it has time to settle on one pattern, so there is less disruption and fewer health problems.

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Metropolitan	E	E	L	L	N	N	R	R	E	E	L	L	N	N	R	R
Continental	E	E	L	L	N	N	N	R	R	E	E	L	L	L	N	N
Slow rotation	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

E = early 6 am–2 pm L = late 2 pm–10 pm N = night 10 pm–6 am R = rest
 Rapid rotation: shift changes every few days (top two rows).
 Slow rotation: the same shift for several weeks before a change.

On-call work: the worker is available for a long stretch, such as 24 or 36 hours, and comes in or works **whenever needed**. Example: a hospital doctor on call overnight, or an engineer who is phoned when a machine breaks down.

Flexitime: workers do a **fixed number of hours** (per day or per week) but **choose when** to do them, often around a "core" time. Example: one office worker does 7 am–3 pm and another 11 am–7 pm, both 8 hours. A related idea is a **compressed working week**, such as three 12-hour days with the rest of the week off.

Shiftwork apart from health. For: 24-hour running (a hospital, a factory line), extra pay for unsociable hours, fitting work around family. Against: nights, weekends and holidays at work, a disrupted family life and no settled routine.

Effects of shiftwork on health and accidents

Health: Knutsson (2003) reviewed many studies of shiftwork and health. The **strongest** links were with:

- **gastrointestinal problems**, especially **peptic (stomach) ulcers**, which are more common in shift workers than day workers;
- **cardiovascular (heart) disease**;
- **pregnancy outcomes: premature birth, low birth weight** and miscarriage.

Links with **death rates** were small or absent. The evidence on **diabetes** was weak (though some studies found higher BMI). Knutsson found **no evidence** that shiftwork raises the risk of **cancer**, so never name it as an effect; name ulcers, heart disease and pregnancy problems. **Sleep disturbance** and tiredness are also common, but say what they lead to.

Accidents: Gold et al. (1992). A **survey** (questionnaire) of **female nurses** at a hospital in **Massachusetts, USA** (over 600 took part) about their shifts, their sleep and any accidents or errors.

- Nurses were grouped by shift: **day/evening, night, day/evening with occasional nights**, and **rotators**. A **rotator** worked a mix of shifts within a month: **at least 4 day or evening shifts and at least 4 night shifts**.
- **Findings:** compared with nurses on day/evening shifts only, rotators' sleep was **more disturbed** and they **fell asleep on the job** more often. Their chance of **dozing at the wheel** on the commute was **doubled**, and so was their chance of reporting a **sleepiness-related accident or error**. The errors and accidents included **driving accidents, medication errors, job procedural errors and work-related personal injuries**. On workdays, 20% of night nurses slept under 5 hours, against 3% of day/evening nurses, and 39% of day/evening nurses slept over 7 hours.
- **Conclusion:** designing hospital rotas around circadian rhythms could make nurses and their patients safer.

Evaluating shiftwork research.

- **Quantitative and qualitative data:** Gold et al. and Knutsson are almost all **quantitative** (odds, percentages), easy to compare across shift groups, but silent on **why** a nurse nodded off; interviews (**qualitative**) could add that.
- **Questionnaires:** quick and private for a large sample, but nurses may **under-report** errors or misjudge their sleep.
- **Correlation, not cause:** shifts were not randomly assigned, so heart disease could come from **lifestyle** or genetic factors; a **holistic** approach looks at the whole person.

- **Validity:** high ecological validity (real jobs); Knutsson pools many studies; hospital shifts have changed little (temporal validity).
- **Generalisation:** nurses and hospital rotas may differ from factory work or other countries.
- **Determinism:** the body clock's response looks **biologically determined**; free will enters only in choosing a shift job.
- **Application:** employers can switch to **slow rotation** or plan rotas around circadian rhythms.

Accidents at work: human errors

Psychologists (for example Riggio, 1990) sort the **human errors** made by people operating machines into four types. Learn one example for each.

Error	What goes wrong	Example
Omission	Failing to do something that should be done	A cleaner forgets to switch off the power before cleaning a mixer
Commission	Doing something incorrectly, or adding a wrong action that should not have been done	A pilot shuts down the working engine instead of the faulty one
Sequencing	Doing the right actions in the wrong order	Opening a valve before the pressure has been released
Timing	Doing something too early, too late, too quickly or too slowly	Braking a forklift too late at a corner

An error of commission often comes from **misusing** information. Biases that can drive it include **belief perseverance** (still relying on information that has been shown wrong), **sunk cost bias** (sticking with a plan because so much has gone into it) and **hindsight bias**.

Errors rise with **fatigue** (more happen on the 8 pm–6 am "graveyard" shift), **alcohol or drugs** and, some argue, an **accident-prone** personality. In an emergency people fall back on habit (**motion stereotypes**) or use the wrong control (**substitution errors**).

Accidents at work: system errors in operator–machine systems

An **operator–machine system** is a person and a machine linked by the machine's **displays** (how it informs the operator: dials, lights, screens, alarms) and **controls** (how the operator directs it: knobs, switches, levers). A **system error** lies in that design: a **warning light too dim** or a **buzzer too quiet** to notice, **controls that look alike** or are not user-friendly, or a whole system too complex to manage in a crisis, as at **Three Mile Island**.

Most accidents **combine** human and system error. Two fixes: **design the machine to fit the operator** (clear displays, distinct alarms, controls that can't be confused) or **train the operator to fit the machine** (full training, then refresher sessions).

Reducing accidents: a token economy (Fox et al., 1987)

A **token economy** uses **operant conditioning**: safe behaviour is **positively reinforced** with tokens (stamps, chips) that have no value in themselves but can be **saved and swapped for goods**. Tokens can be given to individuals or to a whole group, for example when a team goes a month with no injury.

Fox et al. (1987) introduced a token economy at **two open-cast (open-pit) mines**.

- Workers earned **stamps** for working without an injury that cost time off work (for themselves and for their work group), for avoiding accidents that damaged equipment, and for actions that **prevented** an accident or injury.
- Stamps were **taken away** for unsafe behaviour that could cause an accident.
- Stamps could be exchanged for thousands of items at local stores.
- **Results**: large falls in **days lost** through injury, in the **number of lost-time injuries** and in the **cost** of accidents and injuries. The money saved was far more than the scheme cost, and the improvement lasted for **years**. After early doubts, workers and their families valued the rewards, and morale seemed to improve.

Evaluation. A **situational** fix that is easy to **apply**; but people value rewards differently (**individual** factor), the scheme costs money, safe behaviour must be **monitored**, tokens may be given unevenly, and two mines may not **generalise** to an office. Injury records are fairly **objective**, though each injury still has to be reported.

Monitoring accidents and risk events: Swat (1997), the key study

Aim: to develop a useful way of recording and monitoring accidents at work so they can be reduced.

Sample and method: a **three-year longitudinal** study of **four old industrial plants in Łódź, Poland**: a **foundry**, a **machinery plant**, a **meat-processing plant** and a **furniture factory**, with **2964 employees** in all. **83 accidents** were analysed for their **frequency**, **severity** and **direct and indirect causes**. Data came from three sources: summary accident reports kept by the **safety supervisors**, the researcher's own study of the **record (protocol) of each accident**, and **interviews** with safety supervisors and line managers.

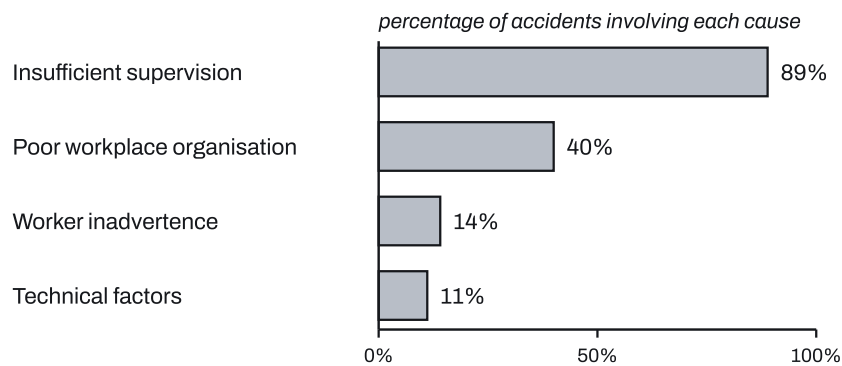
Accident frequency in this study is the number of **injury accidents that led to sick leave** for every **100 employees in a year**. Minor incidents are not counted. The two plants with the highest rates were the **foundry (5.9)** and **meat processing (2.8)**.

$$\text{accident frequency} = \frac{\text{injury accidents with sick leave}}{\text{employees} \times \text{years}} \times 100$$

Findings:

- **Poor housekeeping**, meaning untidy or badly kept workplaces, played a part in **45.8%** of the accidents: slippery floors, faulty stairs, stumbles, using tools not suited to the job, hot slag getting into a shoe because trousers had shrunk and were too short, work pieces dropping onto a worker, loose clothing caught in moving parts.
- The **types** of accident differed a lot between plants. For example, slips and falls were rare in the furniture plant but common in meat processing.

- A further study at a meat-processing plant in 1994 found that **95%** of accidents had **not been reported**.
- Swat identified **four main causes**: **insufficient supervision** (no proper check that workers followed safe procedures) in **89%** of cases; **poor workplace organisation** (such as poor protective equipment, too fast a pace, wrong procedures, nobody put in charge of a group task) in **40%**; **worker inadvertence**, an individual slip that a supervisor could hardly foresee, in **14%**; and **technical factors** (faults in equipment, or equipment that did not meet its requirements) in **11%**. These add to more than 100% because one accident can have several causes.



Conclusions (what Swat recommended; don't confuse these with the findings or the causes):

1. Record each accident by the **circumstances** in which it happened and especially by its **type** (falls and slips, manual handling, machine, energy, vehicle and so on).
2. Record **minor incidents** too, especially every injury that only needed **first aid**, since small accidents point to where bigger ones will happen.
3. Treat **poor housekeeping** as a risk factor in its own right and build it into the **safety monitoring system**. Housekeeping faults are management faults, so they can be fixed.

Why accident data may be inaccurate or incomplete: an accident may have to pass a **threshold** to be logged (a hospital visit, time off), so minor ones vanish; a firm may prefer not to log an accident because an official report could **halt production** during the inquiry; workers may **hide, play down or distort** an accident for **fear of losing their job**; the worker, company and safety authority may **define "accident" differently**; and a frequency count ignores **severity** (one day off or months).

Accident frequency is formally reported under one rule in every plant and is **quantitative**, so plants and industries can be compared; but it ignores **severity** and leaves out **minor incidents**.

Weaknesses of longitudinal studies of accidents: over the years the **workforce turns over**, **machinery and technology** are updated, **company policy** changes and **accident-prevention schemes** start or stop, so accident numbers from different years are hard to compare. In a study of organisations a leaver is simply replaced, so "the workforce turns over" is a better point than "participants drop out".

Generalising from Swat. For: four very **different trades** and 2964 workers, so categories that fit all four may fit others. Against: **old plants in one city in one country**; housekeeping may matter there but not elsewhere.

Other issues. Records are fairly **objective** (a report exists or it doesn't), but deciding to report, and the interviews, are **subjective**. The causes are mostly **situational**, with worker inadvertence the **individual** one. Swat seeks general rules across plants (**nomothetic**), not each accident's story (**idiographic**).

Key facts and formulas

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

Fact	Status
Hawthorne (1920s, Chicago): lighting lowered vs constant; output rose in both; behaviour changes when people know they are studied	Learn it
Oldham and Brass (1979): US newspaper's move to open plan; 3 waves, 7-point scales; satisfaction and motivation fell; "fishbowl"	Learn it
Rapid rotation (metropolitan 2-2-2, 2 off; continental 2-2-3, 2 off, ...) vs slow rotation (every few weeks); on-call; flexitime	Learn it
Knutsson (2003): ulcers, heart disease, pregnancy outcomes; Gold et al. (1992): rotators had twice the odds of nodding off driving and of sleep-related errors	Learn it
Human errors: omission, commission, sequencing, timing; system errors: displays and controls	Learn it
Fox et al. (1987): stamps at two open-cast mines; fewer lost-time injuries, days lost and costs	Learn it
Swat (1997): 4 plants, Łódź, 2964 employees, 83 accidents; supervision 89%, organisation 40%, inadvertence 14%, technical 11%; housekeeping 45.8%	Learn it
Accident frequency = $\frac{\text{injury accidents with sick leave}}{\text{employees} \times \text{years}} \times 100$; foundry 5.9, meat processing 2.8	Learn it

How to do it

We have tagged 48 questions on this topic, from 2021 to 2026 (Papers 3 and 4; 33 different questions, as variants repeat them). 20 of them have parts of more than one type, so the counts add up to 96.

Question type	Questions
Recall the details of a key study	15
Suggest a reason, effect or way to reduce accidents	15
Evaluate a method or study	15
Plan a study on work conditions and justify it	13
Define or explain a key term	12

Question type	Questions
Discuss strengths and weaknesses with a conclusion	8
Describe and evaluate essay	7
Apply to a workplace scenario	5
Give findings from a table or graph	3
To what extent essay	3

Papers before 2024 used the older syllabus, which also had bullying at work and safety promotion campaigns (Cowpe, 1989); those parts are no longer examined. Since 2024, Paper 3 has a short scenario question and a 16-mark essay (Q16), and Paper 4 has an 8–10 mark question on a study (Q7 or Q8) and a 24-mark plan (Q12).

1. Recall the details of a key study (15 questions)

Usually 1 mark per point plus 1 for a detail, so give **fewer points, each with a detail** (a percentage, an example, a place).

1. Check exactly **what** is asked: conclusions, causes, findings, the sample, or how data was collected.
Swat's conclusions given for "causes", or findings given for "conclusions", score 0.
2. State the point, then add one specific detail from the study.

What gets asked: Swat's **causes** (a correct percentage earns the extra mark) and **conclusions** (with an example such as slips on wet floors); the **two highest accident frequencies** (foundry 5.9, meat processing 2.8); **how Oldham and Brass collected data** (three waves, 7-point scales, interviews) or the whole study; **Gold et al.'s** errors and accidents (only the four in the study were accepted); the **Hawthorne IV and DV**; how a **token economy** works.

2. Suggest a reason, effect or way to reduce accidents (15 questions)

These are [2] each: **1 for the idea, 1 for applying it** to the setting. Make one clear suggestion, then add "because ..." or "for example ..." tied to the factory, office or study in the question.

Common prompts (the points are in "Understand it"): why accident data is inaccurate or unreported ("because it was minor" gets 1; add that it needed only first aid and no time off for 2); how to reduce an error or accidents (token economy, training, redesigned displays and controls, a SMART target, a safety supervisor), described for this workplace; why open plan hurts concentration; which **job characteristic** changes after an office move and which way; health effects of shiftwork; **other ways to organise hours** [4] (flexitime, on-call, compressed week, 9–5, each with an example); other explanations for Hawthorne.

3. Evaluate a method or study (15 questions)

Each point earns **up to 2**: 1 for the point, 1 for applying it with a detail from the study. "Longitudinal studies take a long time" gets 1 at most.

1. Name the strength or weakness.
2. Show it **in this study**: a name, number or place.
3. Answer the exact target: weaknesses **of longitudinal studies** (turnover, new machinery, policy changes, prevention schemes) are not weaknesses **of Swat's study** (one country).

The ready-made points are in "Understand it": accident data, accident frequency, longitudinal designs, generalising Swat and Oldham and Brass. Two more: a **7-point scale** gives comparable scores over a range of answers, but its **mid-point** lets people sit on the fence (a 6-point forced choice avoids this); and a **holistic** approach to shiftwork helps because the health links are correlations that lifestyle may explain. For Oldham and Brass from a single study, add that workers **adapt** (headphones, their own barriers).

4. Plan a study on work conditions and justify it (13 questions)

Paper 4 Section B. The plan [10] is marked on levels for the **specific features** of the named method and the **general features** of any study. Use **only** the method named (an experiment, an interview, a questionnaire...), and cover each feature the question lists.

1. **Specific features.** Experiment: type (laboratory or field), IV with its levels, DV and how it's measured, controls, design (independent or repeated measures), and counterbalancing or random allocation where relevant. Interview: technique (face-to-face or telephone), format (structured, semi-structured, unstructured), open and closed questions with **examples**, how answers are **scored or interpreted**, number of questions.
2. **General features.** Aim or hypothesis, sample and sampling technique, procedure, location, ethics, type of data and analysis (descriptive statistics), steps for validity and reliability.
3. **(b)(i) Describe the psychology** [4]: the theory or study the plan rests on, in detail (Fox et al.'s stamps; the rotas with Knutsson or Gold et al.; Hawthorne and optimal levels; flexitime and job satisfaction).
4. **(b)(ii) Two features used** [4]: for each, 1 mark for following from (b)(i) and 1 for it **appearing in your plan**. For example: "Fox et al. gave stamps for injury-free shifts, so my IV is a token for every injury-free week."
5. **(c) Reasons and weaknesses** [2 each]: a reason or weakness **for your own choice**, applied to your plan. Weaknesses must match the design you chose.

Reasons and weaknesses to have ready (always add "in my study, ..."):

- **Independent groups**: a token group compared directly with a control group; but participant differences aren't controlled and more workers are needed. **Repeated measures**: participant variables controlled; but **order effects**, and workers may guess the aim.
- **Field experiment**: high **ecological validity** (real jobs) but less control. **Laboratory**: high control, so the IV more likely caused the DV, but low ecological validity.
- **Controls** (same job, same shift pattern, same site): the DV is more likely due to the IV; but too many make it artificial and invite demand characteristics.
- **DV**: a count such as days off sick or injuries gives quantitative, comparable data that shows a real effect.

- **Interview format:** structured (same questions, same order), semi-structured (set questions plus follow-ups), unstructured (free answers). **Technique:** face-to-face shows non-verbal cues but may reduce honesty; telephone reaches a wider sample but people may hang up.
- **Scoring:** rating scales or yes/no give comparable, analysable scores, but a mid-point lets people opt out; open answers need **two or more raters** to code them, who may disagree.
- **Ethics:** the right to withdraw (workers may fear for their jobs) and protection from harm (no harmful noise levels).

Contexts so far: rotation and health; a reward system for accidents; a physical condition and productivity; flexitime and job satisfaction; office design and concentration; a safer machine; which errors cause most accidents. A plan that just **repeats Hawthorne** is capped at Level 1: choose your own condition and levels (such as several noise levels, none harmful).

5. Define or explain a key term (12 questions)

These are [2]: a definition **plus** a detail or example. Terms asked so far: **error of commission** (with an example); **accident frequency** ("injury accidents" is essential for 2 marks); **open plan office**; **rotator** in Gold et al. (4 or more day or evening shifts and 4 or more nights in a month); **temporal conditions** (time, with shiftwork or on-call as the example); **Hawthorne effect** ("demand characteristics" alone scored 0); **reductionism versus holism** (parts versus the whole person); **metropolitan versus continental** rota; **one physical and one psychological** work condition (lighting; recognition). Know all four human errors, since any could be next.

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

Old Paper 4 (2021–2023), [5]: **1 mark per strength or weakness tied to the topic** (up to 4; untied points score at most 2 in all) and **1 for a conclusion**.

1. Give two strengths and two weaknesses about the exact topic (interviews on office preference, Gold et al.'s nurses, shiftwork other than health).
2. End with a **judgement** reached by weighing them ("interviews are worth using, but only with a rating scale"); a summary scores 0.
3. Obey the stem: when it says "other than health", health points earn nothing.

7. Describe and evaluate essay (7 questions)

Paper 3 Section B Q16: **(a) describe [6], (b) evaluate [10]** with a **named issue** (before 2024: 8 + 10).

1. **(a)** Since 2024 the question lists **two bullet points**, and each is marked separately (1–3 marks each, added). Cover **both**. For a bullet that says "a study", the top mark needs the **procedure and at least one result**.
2. **(b)** Start with the **named issue** (quantitative and qualitative data, objective and subjective data, experiments, validity), applied to both bullets. Then two or three more syllabus issues (see the evaluation paragraphs in "Understand it"), each with an example from the study and a counter-point. Marks are best

fit, so one superficial paragraph pulls the level down.

Essay pairings so far: rotation with a shiftwork study (rotas and circadian rhythms; Gold et al. or Knutsson); token economy with monitoring accidents (Fox et al. and Swat); physical conditions with open plan offices (Hawthorne and Oldham and Brass). Each section of "Understand it" ends with the evaluation points to use.

8. Apply to a workplace scenario (5 questions)

Paper 3, [4] or [6]. Each point: **1 for the idea, 1 for linking it** to the person or company. Name the term (error type, job characteristic, effect), then use the scenario's details. If a later part says "for the way you suggested", give a weakness **of that way**, in context (the cost of tokens; checking everyone's goggles on a busy line). One question mixed in leadership (Heifetz's principles for a change in working hours).

9. Give findings from a table or graph (3 questions)

Old Paper 4. Each finding is a **comparison with numbers**: "20% of night nurses slept under 5 hours, compared with 3% of day/evening nurses", not just "night workers slept less". Use **trends** (all three Oldham and Brass means fell from T1 to T3) and the **biggest change** (interpersonal satisfaction, down 0.32).

10. To what extent essay (3 questions)

Old Paper 4 Section C [12]: weigh a claim using research, then reach a reasoned conclusion.

- **"All accidents are system errors, not human error"**: against, Riggio's four human errors, fatigue on the night shift, alcohol or drugs, accident-proneness, substitution errors; for, Three Mile Island, dim lights and quiet buzzers, confusing controls. Conclude that most accidents combine both.
- **"The Hawthorne studies' reductionist method is best"**: for, isolating lighting while controlling the rest shows cause and effect; against, people differ, and the factors interact (pay, attention, supervision), which is exactly what Hawthorne revealed. Examiners wanted a discussion of reductionism, not just an evaluation of Hawthorne.

Worked examples

Example 1

A frozen-food warehouse runs day and night. Packers change between early, late and night shifts every two days, with two rest days after each set of nights.

(a) Identify the type of shiftwork the packers work, and explain why it may harm their health. **[3]**

(b) Suggest **one** other way the warehouse could organise its office staff's hours, other than shiftwork. **[2]**

(a) This is **rapid rotation**, a **metropolitan rota** (two of each shift, then two off) (**B1**). Changing shift every two days means the packers' **circadian rhythms** never have time to adjust to one pattern (**B1**), which is linked to health problems such as **peptic ulcers** and **heart disease** (Knutsson, 2003) (**B1**).

(b) **Flexitime** (**B1**): each clerk works 8 hours a day but chooses when, for example 7 am to 3 pm to collect children from school, as long as they are in for a core period such as 10 am to 2 pm (**B1**).

Example 2

At a water treatment works, a technician adds a chemical to the tank before reading the water-quality gauge, which is the wrong way round. The gauge is a small dial mounted above head height.

(a) Explain the type of human error the technician made. [2]

(b) Explain how the design of the operator–machine system may also have contributed. [2]

(c) Suggest **one** change the works could make to reduce this type of accident. [2]

(a) An error of **sequencing** (**B1**): both actions were correct, but they were done in the wrong order, adding the chemical before checking the reading (**B1**).

(b) This is also a **system error** in the **display** (**B1**): a small dial placed above head height is hard to read at a glance, so the technician may have skipped it or misjudged it (**B1**).

(c) **Design the machine to fit the operator** (**B1**): move the reading to a large screen at eye level next to the dosing control, with the dosing control locked until the reading has been taken (**B1**).

Example 3

A paper mill employs 250 people. Over two years, 12 injury accidents led to workers taking sick leave, and a further 30 minor injuries were treated with first aid only.

(a) Using the definition in Swat (1997), calculate the mill's accident frequency. [2]

(b) Using one of Swat's conclusions, explain why the mill should also record the 30 first-aid injuries. [2]

(c) In Swat's study the percentages for the four causes of accidents add up to more than 100%. Explain why. [2]

(a) Only the injury accidents with sick leave count (**B1**):

$$\frac{12}{250 \times 2} \times 100 = 2.4 \text{ accidents per 100 employees per year} \quad (\text{B1})$$

(b) Swat concluded that **minor incidents**, especially injuries needing only **first aid**, should be recorded (**B1**): 30 small injuries show where in the mill a more serious accident is likely, so the cause can be fixed first (**B1**).

(c) One accident can have **more than one cause** (**B1**): for example, a fall could involve both insufficient supervision and poor workplace organisation, so it is counted under both, and $89 + 40 + 14 + 11 = 154\%$ (**B1**).

Example 4

(a) Describe what psychologists have discovered about physical work conditions:

- the Hawthorne effect, and
- the impact of open plan offices, including a study. [6]

(b) Evaluate what psychologists have discovered about physical work conditions, including a discussion of longitudinal studies. [10]

(a) Hawthorne. In the 1920s at the Western Electric plant, researchers lowered the lighting step by step for one group while a control group's lighting stayed the same. Output (such as assembling relays) went up in both groups. They concluded workers changed because they knew they were being studied and were getting special attention: the Hawthorne effect. Others suggest pay linked to output, rest pauses or friendlier supervision could explain it.

Open plan. An open plan office has no interior walls or private offices. Oldham and Brass (1979) followed newspaper employees in the Midwest USA through a move into an open plan office, with questionnaires (7-point scales on autonomy, feedback and other job characteristics) before the move and twice after it, plus interviews. Work satisfaction, interpersonal satisfaction and internal motivation all fell (work satisfaction from 5.37 to 5.11), and staff called the office a "fishbowl", saying they could not concentrate or talk privately.

(Each bullet has procedure and a result, so each can reach L3: 3 + 3 = 6.)

(b) Named issue: longitudinal studies. Oldham and Brass measured the same employees before the move and twice after it, so each person was their own baseline and the fall in satisfaction could be tracked. **(Point applied.)** But staff who disliked the office may have left before the last wave, and the study stopped a few months after the move, so it cannot show whether people got used to it. **(Counter-point, analysed.)** In the Hawthorne studies the test-room workers were set apart as a special group, so their rising output over time may reflect that position rather than the lighting. **(Second study, linked.)**

Experiments. Hawthorne's control group showed lighting was **not** the cause, since output rose in both groups. Oldham and Brass was a quasi-experiment: the company chose who moved and the control group had only 5 people, so group differences could explain the results.

Validity. Real workplaces give high ecological validity, but 1920s factories and 1979 offices limit temporal validity.

Data. The 7-point ratings gave comparable quantitative scores; the interviews added qualitative reasons ("fishbowl"); named questionnaires risk socially desirable answers.

Application. Firms planning open plan could add quiet rooms, and any workplace trial should expect the Hawthorne effect to inflate early results.

(Each paragraph is a separate issue applied to the studies with analysis: top band.)

Common mistakes

- **Answering a different part of Swat.** Asked for **causes**, many give **conclusions**; asked for conclusions, others give **findings**. Learn the lists separately.
- **"Poor housekeeping" with no explanation.** Say what it covers (slippery floors, faulty stairs). It is **not** one of the four causes.
- **Saying Oldham and Brass measured productivity.** They measured job characteristics, satisfaction and motivation, and asked about concentration. Lack of a productivity measure is one of the study's weaknesses.
- **Confusing "temporal" with temperature or temporary.** Temporal means time.
- **Saying shiftwork is a way to make people work shorter hours.** Shiftwork spreads work round the clock; the hours are the same, only the times change.
- **Health effects without the health.** "Lack of sleep" alone doesn't earn the mark; say what it leads to, or name ulcers, heart disease or pregnancy problems.
- **Naming cancer as a health effect of shiftwork.** Examiners gave no credit for it: Knutsson found no evidence of a raised cancer risk. Use ulcers, heart disease or pregnancy problems.
- **Saying Fox et al. took tokens away when a worker was injured.** They didn't: an injury simply meant the worker earned no stamps for that period. (Stamps were removed only for unsafe behaviour.)
- **Generic or misdirected evaluation.** "Longitudinal studies take a long time" with no link to the study earns 1 at most; and weaknesses **of the study** (one country) don't answer a question about weaknesses **of longitudinal studies** (turnover, new machinery, policy changes).
- **Brief "suggest" answers.** "Because it was minor" gets 1; add why it went unrecorded for 2.
- **In a plan, using a different method from the one named,** or just copying the Hawthorne lighting study (capped at Level 1).
- **A conclusion that summarises.** In a [5] discuss question, the conclusion must make a judgement.

How to get the marks

- **Identify, then develop.** Most short parts give 1 mark for the point and 1 for detail, an example or applying it. Write "point, because/for example ..." every time.
- **"Outline" or "Describe"** a study [4]: sample and place, what was done, what was measured, a result. For an essay (a), the top band needs the **procedure and at least one result** for each bullet.
- **"Explain"** a term [2]: definition plus example. **"State"** [1 each]: the fact only (foundry, meat processing).
- **"Suggest"** [2]: a sensible idea, applied to the context given; it does not need to come from a study, but must fit the scenario.
- **"Evaluate"** in the essay (b): start with the **named issue**, go issue by issue, apply each to the studies with examples, and give the other side. Describing the studies again earns nothing in (b).
- **"Discuss ... with a conclusion"** [5]: both sides, tied to the topic, then a reasoned decision.
- **Plans** [10]: every feature the question names, in detail, plus the general features. Then in (b)(ii) say exactly where each feature of the psychology shows up in your plan.

- **Numbers earn marks.** A correct percentage (89% supervision) or accident frequency (5.9) is often worth the extra mark. Learn the key numbers.
- **Read every word of the stem.** "Other than temperature", "other than health", "other than rotation of shifts" and "this study" all change what is creditworthy.

Quick check

1. Explain what is meant by **on-call** work, with an example. **[2]**
2. A pharmacist gives a patient the correct medicine, but three hours after it was due. Name the type of human error.
3. Swat linked 45.8% of the 83 accidents to poor housekeeping. About how many accidents is that?
4. Explain **one** reason why slow rotation may be better for health than rapid rotation. **[2]**
5. Explain **one** reason why the findings of Fox et al. (1987) may not generalise to an office. **[2]**

Answers

1. On-call means being **available for a long period, such as 24 or 36 hours, and working whenever needed** (1). For example, a hospital doctor on call overnight who is called in for an emergency operation (1).
2. A **timing** error: the right action was done, but too late.
3. $0.458 \times 83 = 38.0$, so about **38** accidents.
4. With slow rotation the shift only changes every few weeks, so the body's **circadian rhythm** has time to adjust to the new pattern (1); with rapid rotation it never catches up, which is linked to sleep problems and illnesses such as ulcers (1).
5. Fox et al. studied **two open-cast mines**, a dangerous setting where injuries that cost time off are common (1); in an office such injuries are rare, so there would be little safe behaviour to reward and the scheme might not cut accidents in the same way (1).

Past questions to try

- 9990/42/F/M/25 Q7: Swat's causes, why accidents go unreported, and generalisation.
- 9990/43/O/N/24 Q7: accident frequency, the highest-rate plants, and its strengths and weaknesses.
- 9990/42/F/M/24 Q8: how Oldham and Brass collected data, a job characteristic, and evaluating the method.
- 9990/33/M/J/24 Q15: naming a worker's error, a way to avoid it and a weakness of that way.