

Cambridge AS & A Level · Psychology 9990 · Notes

Andrade (doodling)

AS

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What you need to know

The syllabus asks the same things of every core study. For Andrade (2010), a laboratory experiment on whether doodling helps a person concentrate and remember, you should be able to:

1. **Explain the psychology being investigated:** **attention** and **memory**, which here means concentration, boredom, daydreaming and doing two tasks at once (dual-task processing).
2. **Give the background:** why boredom matters for attention, and why people had expected a second task such as doodling to get in the way of the main one.
3. **State the aim** of the study.
4. **Describe the procedure and its methodology:** a **laboratory experiment** with an **independent measures** design; the sample (size, ages, sexes, how they were recruited); the mock telephone message; the doodling sheet; the monitoring task and the surprise memory test; the controls; the independent and dependent variables and how each was measured.
5. **Discuss the ethical issues:** deception about the memory test, consent, the right to withdraw, debriefing and payment.
6. **Give the results:** which group monitored better and recalled more names and places, the shading data, and how the results could be shown (for example as a bar chart).
7. **State the conclusions** that were or could be drawn.
8. **Evaluate every part of the study:** its method, sample and sampling technique, design, data, validity, reliability, generalisability and ethics.
9. **Relate it to the AS issues and debates** that fit: the application of psychology to everyday life, and individual and situational explanations. The syllabus also lists nature versus nurture and the use of children and of animals, to be applied "where appropriate"; Andrade tested adult humans only, so those last two can only be used as a contrast with other studies.
10. **Explain why it belongs to the cognitive approach**, using the approach's two assumptions, and compare it with the other cognitive core studies, Baron-Cohen et al. and Pozzulo et al.

Understand it

The psychology: attention and memory

Attention is how the mind picks out part of what is around us to work on while the rest is ignored. It can be aimed at one source and away from another (selective attention), shared across more than one job at the same moment (divided attention), or set up in advance to catch something we are expecting (priming).

Concentration means holding attention on one task for a stretch of time.

Memory is how information is taken in, stored and later brought back. You can only remember what you noticed in the first place, so anything that helps attention should help memory too.

Two ideas sit behind the study:

- **Boredom and arousal.** To keep concentrating, a person needs to stay reasonably alert (their level of arousal). A dull task lets alertness sink, the mind drifts off into **daydreams**, and attention is pulled away from the task.
- **Dual-task processing.** Running two tasks together usually means they share one limited pool of mental capacity, so one or both suffer, or processing slows down. Researchers give people two tasks at once (dual-task designs) to work out what that capacity is and how it gets shared.

Background: does a second task help or hurt?

Plenty of people doodle when they are bored, for example during a long phone call or a dull meeting. The common view was that any extra task, doodling included, takes attention off the main one. That view left out what boredom does. When someone is bored, a very simple extra task might keep them alert and stop their mind wandering, so that they follow the main task **better**. A daydream may cost far more attention than shading a shape does.

The aim

To find out whether **doodling helps concentration** on a boring task, so that people who doodle while listening take in and **remember** more of what they hear than people who don't.

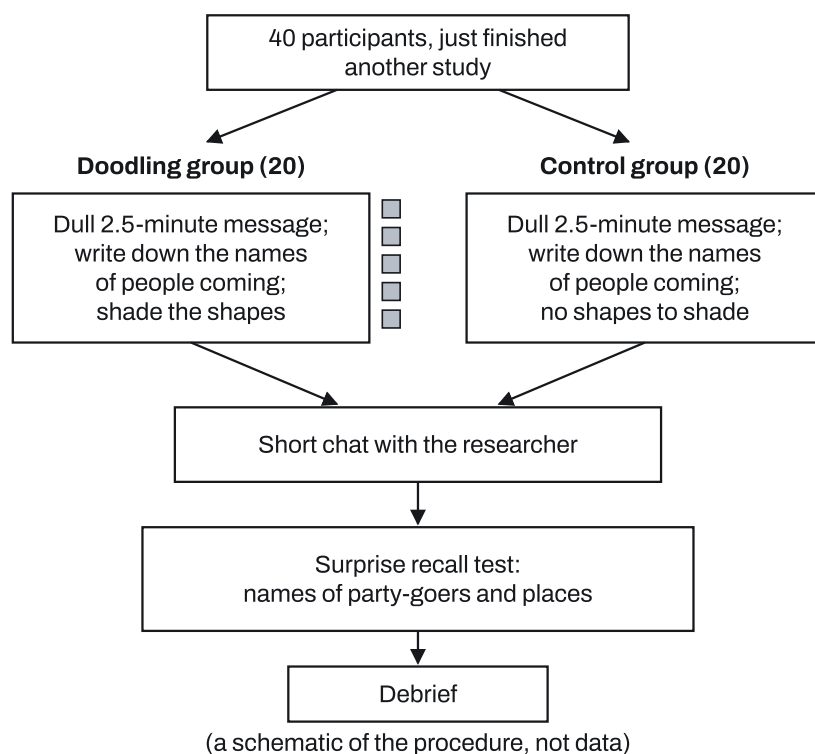
The sample

Feature	Detail
Size	40 participants, 20 in each group
Who	Members of a participant panel at a psychology research unit (the Applied Psychology Unit), from the general population
Ages	18 to 55

Feature	Detail
Sexes	35 women and 5 men; most mark schemes give 17 women and 3 men in the doodling group, 18 women and 2 men in the control group
Sampling technique	Opportunity sampling: each person had just finished an unrelated experiment and was asked to spend another 5 minutes helping with a second study
Payment	Paid for taking part

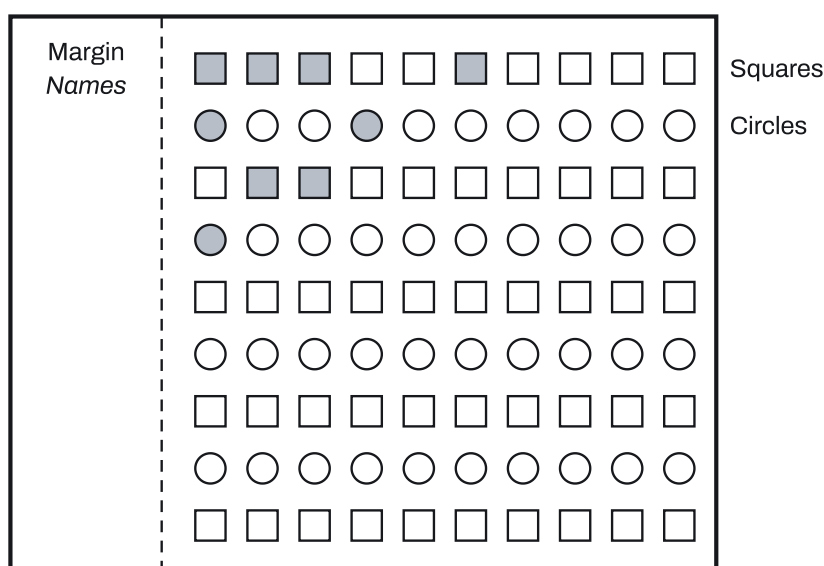
Because they had just done another study, participants were likely to be a little tired and bored already, which suited a study about boredom.

The procedure



- Participants were taken into a **visually dull, quiet room** and randomly allocated to the **doodling** or the **control** group.
- Each listened to the same **mock telephone message** about a party. The message was:
 - **recorded** (on audio cassette), so every participant heard exactly the same thing;
 - spoken in a **monotonous**, dull voice at **227 words per minute**;
 - **2.5 minutes** long;
 - played at a volume each participant found **comfortable**;
 - full of **eight names of people coming** to the party, **three names of people (and a cat) who were not coming**, **eight place names**, and lots of irrelevant chat.
- The monitoring task (both groups).** Participants had to write down the names of the people who were **coming** to the party, but not those who couldn't come. They were told they didn't need to remember anything. This was the **main task**.

4. **The doodling group** also had a sheet to shade while listening: A4 paper with **alternating rows of squares and circles, 10 shapes per row**, each shape **1 cm across**, and a **margin down the side** (4.5 cm wide) for writing the names. The instructions said the shading was only there to ease boredom, so neatness and speed were unimportant. The **control group** had paper to write the names on, but no shapes to shade.
5. After the message, the researcher chatted with each participant for about **one minute**, so everyone had the same delay, and the same chance to forget, before the test.
6. **The surprise memory test.** Participants were unexpectedly asked to write down (recall) the **names of the people coming to the party** and the **places** mentioned. The places were **incidental information**: nobody had been asked to listen for them. The order of the two recall tasks was **counterbalanced**.
7. **Debrief.** Participants were told the real aim and asked whether they had suspected a memory test.



A4 sheet, 10 shapes per row (schematic, not to scale)

How each measure was scored

Measure	How it was scored
Monitoring performance	Correct party-goers written down minus false alarms
Recall (memory score)	Correct names (or places) recalled minus false alarms
Incidental recall	The number of places recalled correctly
Doodling	The number of shapes shaded by each doodler

A **false alarm** was a wrong name, of one of two kinds: a **new name** that was never in the message, or the name of one of the **lures** (people mentioned who were *not* coming). A name that sounded like a real one and was probably just misheard was counted as correct.

Variables, design and controls

- **Research method:** a **laboratory experiment**. An IV was manipulated, DVs were measured, and it took place in an artificial, controlled setting with equipment.
- **Independent variable:** whether the participant **doodled** (shaded shapes on the sheet while listening) or not (control).
- **Dependent variables:** **monitoring performance** (correct names minus false alarms) and **recall** of names and places in the surprise test.
- **Experimental design: independent measures.** Each participant was in only one group, doodling or control, and allocation was random.
- **Controls and standardisation:** the same recorded message, at the same speaking rate and length for everyone; a comfortable volume; the same dull, quiet room; everyone had just done another study, so all were similarly bored; everyone had paper; standardised instructions; the same one-minute conversation before the test; counterbalanced recall order; everyone was paid.
- **Data: quantitative** (numbers of names and places, shapes shaded).

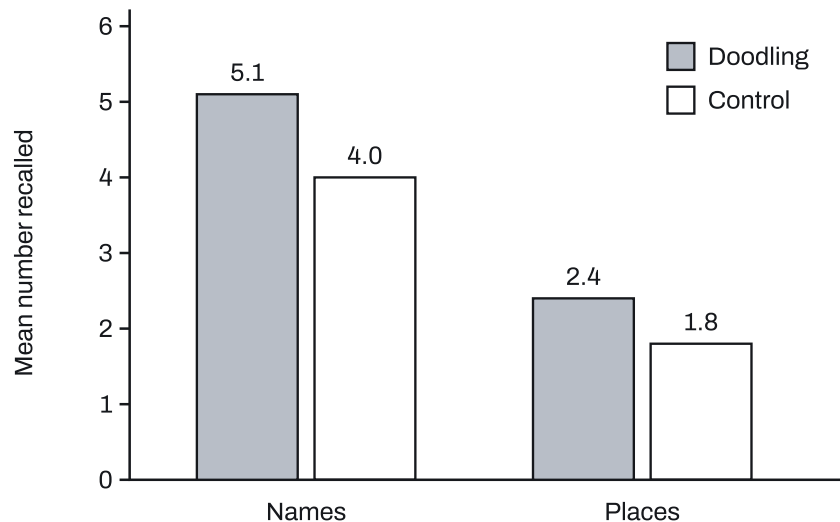
Ethical issues

- **Deception:** participants were not told about the memory test and believed their only job was to note down names. This was **necessary**: had they known, they would have set out to memorise the names and places, and the results would have shown effort, not the effect of doodling on attention. Doodlers were also told the shading was just to ease boredom.
- **Debriefing:** everyone was told the real aim afterwards, which deals with the deception.
- **Consent and the right to withdraw:** participants agreed to help and, like any participants, should have been free to stop; but they could not give fully informed consent because of the deception.
- **Protection from harm:** the task was harmless; at worst it was boring for 2.5 minutes.
- **Payment:** participants were paid, which is fair for their time.

The results

- **Monitoring:** the doodling group was **more accurate** at writing down the party-goers; more doodlers than controls got the maximum monitoring score.
- **Recall:** in the surprise test the doodlers recalled **more names and more places** than the controls. A Cambridge specimen mark scheme gives the means below, and both differences were **significant**.

Mean number recalled	Doodling group	Control group
Names of party-goers	5.1	4.0
Places	2.4	1.8



Means from a Cambridge specimen mark scheme

- **Doodling:** the **mean** number shaded per doodler was **36.3**, with a **range of 3 to 110**. Even the lowest scorer shaded a few shapes, so no doodler left the sheet blank. The midpoint of 3 and 110 is 56.5, and the mean sits well below it, so the typical doodler shaded at the lower end. A gap of 107 shapes between the lowest and highest scorer shows how differently people responded to the same instruction.

Showing the results: a **bar chart** like the one above, with the two groups as separate bars for each kind of information and the mean number recalled on the vertical axis.

The conclusions

- When a listener is bored, shading simple shapes can improve how well they follow what they hear, and they later remember more of it, even details they were never asked to catch.
- The likely reason is that the easy extra task stops alertness from sinking and leaves less room for daydreaming, and a wandering mind costs more attention than shading does.
- A second task is not always a distraction: in the right conditions people can take in information while their hands are busy with something else (dual-task processing).

Why it is cognitive

The cognitive approach has two assumptions (syllabus):

- Information is processed through the **same route in all humans: input → process → output**, in a similar way to a computer.
- People have **individual differences in their cognitive processing**, such as attention, language, thinking and memory, and these processes help explain behaviour and emotion.

Andrade's study fits both. The message was the **input**, attending to it (helped or not by doodling) was the **processing**, and the names recalled were the **output**. And the study explains a behaviour (remembering better) through a **cognitive process** (attention): doodling changed how well people attended, which changed

what they remembered. Participants also differed a lot from each other, for example in how much they shaded (3 to 110 shapes).

Key facts and formulas

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

Fact	Status
Andrade sample: 40 adults aged 18–55, 20 per group, 35 women and 5 men, an opportunity sample from a participant panel who had just finished another study, paid	Learn it
Andrade message: recorded, monotonous, 227 words per minute, 2.5 minutes, comfortable volume, 8 party-goers, 3 people and a cat not coming, 8 places	Learn it
Andrade doodling sheet: A4, alternating rows of squares and circles, 10 shapes per row, shapes 1 cm across, a margin for the names	Learn it
Andrade scoring: monitoring = correct names minus false alarms; recall = correct names or places minus false alarms; false alarms are new names or lures	Learn it
Andrade results: doodlers monitored better and recalled more names (5.1 v 4.0) and places (2.4 v 1.8); shading mean 36.3, range 3–110	Learn it
Mean = $\frac{\text{sum of the scores}}{\text{number of scores}}$; median = the middle score when the scores are put in order (the mean of the two middle scores if there is an even number)	Learn it
Range = highest score – lowest score	Learn it
Percentage difference = $\frac{\text{new} - \text{old}}{\text{old}} \times 100$	Learn it

How to do it

We have tagged 39 questions on this study, from 2021 to 2026 (Papers 1 and 2). 13 of them have parts of two types, so the counts add up to 52.

Question type	Questions
Evaluation: strengths, weaknesses and the 10-mark essay	8
Procedure, materials and sample	8
Psychology investigated, background, aim and conclusions	8
Research methods applied to the study	8
Measuring recall and the data	6
Applications and advice	5

Question type	Questions
The cognitive approach, issues and debates	5
Comparing with another study	4

1. Evaluation: strengths, weaknesses and the 10-mark essay (8 questions)

Short questions (1–4 marks). Identify the strength or weakness (1 mark), then back it with a detail from this study (1 mark). Use these:

Point	Strength or weakness	Example from the study
Standardised procedure (reliability)	Strength	The same recorded message, at 227 words per minute and 2.5 minutes long, and the same instructions for everyone, so the study can be repeated exactly and its results checked
Controls (internal validity)	Strength	Same dull room, everyone similarly bored after another study, everyone had paper, counterbalanced recall order, so the difference in recall is likely to be caused by doodling
Independent measures	Strength	Each person did only one condition, so they had nothing to compare and less chance to guess the aim (fewer demand characteristics), and nobody heard the message twice, so there were no order or practice effects
Independent measures	Weakness	Different people in each group, so participant variables (a better memory, a habit of daydreaming) could explain the difference instead of doodling
Quantitative data	Strength	Names and places recalled are numbers, so the groups can be compared objectively and tested for a significant difference
Opportunity sample	Strength	Quick and easy; the participants had just done another study, so they were already bored and tired, which suits a study of boredom
Opportunity sample	Weakness	Only people on one research unit's panel who happened to be available, mostly women (35 of 40), so the sample may not represent men or people outside that panel
Wide age range	Strength	Ages 18 to 55 from the general population, so the findings apply to a wide range of adults
Ecological validity	Weakness	A mock message in a laboratory, and doodling was imposed (shading given shapes), unlike real doodling in a real meeting
Deception	Weakness (ethics)	Participants were not told about the surprise memory test, so their consent was not fully informed (though they were debriefed)

Variations you will meet:

- **One strength in relation to reliability:** the procedure was fixed in advance, so it can be run again in the same way (1); then show it with a detail, such as every participant hearing one identical recording, with the same words and the same length (1).
- **One strength in relation to the design:** because a participant only ever met one condition, they had no second condition to compare theirs with, which makes the aim harder to spot; or, since nobody did both conditions, nobody was more practised, more tired or more bored by the time of their second go. Don't call the design repeated measures: it was **independent measures**.
- **One strength of the sample** (identify only): the wide age range and both sexes make it fairly generalisable; or the participants were already bored and tired after another study.
- **Generalisability** ("is Seth or Jamie correct?"): **for:** adults from 18 to 55, 40 people, drawn from the general population, and shading while listening is easy to try at work; **against:** just 5 men in total, only 20 per group, everyone from one research unit's panel (who may share interests and motives), and an artificial laboratory task. Pick one side and give several linked points.

The 10-mark evaluation ("two strengths and two weaknesses, at least one about ..."):

1. Plan four points of **equal depth**, one of which is the **named issue** (reliability, generalisations, independent measures, the sampling technique, ethics and so on). Without it the answer is capped at Level 3 (6 marks).
2. For each point: say what the issue is, whether it is a strength or a weakness of **this** study, give **at least two** specific details from Andrade, and explain **why** it matters for the conclusions.
3. **The sampling technique can be either side:** a strength (convenient; participants already bored, so the boredom the study needed was realistic) or a weakness (a narrow, mostly female panel, so less representative).
4. **Independent measures can be either side** too (see the table).
5. Don't describe the study, and don't drift into real-world applications: the examiner reports say these earn little or nothing in an evaluation. Don't write a prepared "GRAVE" essay that misses the named issue.

2. Procedure, materials and sample (8 questions)

Mostly recall, one mark per correct point.

1. **Find which part is asked for:** the **sample**, the **recruitment**, the **telephone message**, the **doodling sheet**, or what a participant in one condition **did**.
2. **Give separate, specific points**, one per mark, with exact numbers (40; 20 per group; 18–55; 35 women and 5 men; 227 words per minute; 2.5 minutes; 8 names; 8 places).
3. **Don't repeat what the question gives you:** if it says "40 participants from a participant panel", give two **other** features.

Variations you will meet:

- **The sample:** 40 participants; opportunity sample; had just finished another study; members of a participant panel at a psychology research unit; general population; aged 18–55; paid; 35 women and 5 men. Write "participant panel" or "research unit": the June 2025 mark scheme did not credit "members of the Medical Research Council" or "students".

- **Recruitment:** opportunity sampling; they had just finished an unrelated experiment; they were asked to give another 5 minutes to help with another study; they were panel volunteers.
- **The telephone message:** recorded on audio cassette; monotonous; 227 words per minute; 2.5 minutes; comfortable volume; 8 party-goers' names; 3 people and a cat not coming; 8 place names; irrelevant chat. Stick to the message: details about doodling earn nothing here.
- **The doodling sheet:** A4; alternating rows of squares and circles; 10 shapes per row; shapes 1 cm across (same-sized shapes); a margin down the side for the names.
- **What a doodler did:** the steps in "The procedure", including at least one doodling step (shading the squares and circles; told neatness and speed didn't matter). The March 2025 report says some answers listed the materials without saying what the participant **did** with them, and "they were asked to doodle" alone earns nothing. Don't spend points on materials details such as 227 words per minute or A4 here.
- **The number in the doodling group:** 20 (not the total of 40).

3. Psychology investigated, background, aim and conclusions (8 questions)

- **The psychology being investigated** (1 mark per point): write about general ideas, not this study. Good points: what attention is and that it can be split between tasks; staying alert is what keeps concentration going; boring material lets attention slip into daydreaming; two tasks done together draw on the same limited capacity, so accuracy or speed can suffer; an extra task is normally expected to distract. Definitions of attention or memory earn credit. Only one mark goes to Andrade's own focus (whether doodling helps concentration and memory). The November 2021 and 2022 reports say many answers stuck to the aim and what happened in the study, which leaves them with that single mark.
- **"What is meant by attention":** say what it does without using the word "attention": the mind directs its limited resources at one particular thing and shuts out the rest (2 marks). Further points: it can be aimed at one thing instead of another, split across tasks, or set up in advance to spot something expected. An example earns 1, for instance Andrade's listeners trying to follow a dreary phone message.
- **The background:** the ideas from "Background" above. Bored people tend to daydream, and doodling is one way people cope with boredom; staying alert is needed to concentrate; psychologists use two-task set-ups to learn about mental capacity; the usual expectation was that a second task harms the first, and boredom's part had not been looked at properly. One mark is available for the aim; **results earn nothing** here.
- **The aim** (2 marks): give the IV and what it might change: "to find out whether shading shapes while listening to a boring message helps people concentrate, so they remember more of it". Only "does doodling help concentration?" is brief (1).
- **One conclusion** (2 marks): a claim about people in general, with its reason: "when a task is dull, having something simple to do with your hands stops the mind drifting off, so people take in and remember more". The claim with no reason ("doodling helps concentration") is brief (1). Reporting what the groups scored is a **result**, worth 0 here.

4. Research methods applied to the study (8 questions)

- **How the IV was operationalised** (2 marks): name the IV, doodling or not (1), and how it was set up in practice (1): the doodlers got a sheet of printed squares and circles to shade during the message, the controls had no shapes to shade. "Doodling and control" alone earns nothing.
- **The experimental design** (2 marks): **independent groups/measures** (1); what it meant here: every participant took part in just one condition, either doodling or control (1).
- **Features of a laboratory experiment**: a manipulated IV; a measured DV; an artificial setting; equipment. Consequences such as "high validity" are not features.
- **Controls and why they matter**: name the control, then say what could have gone wrong without it. A volume set to suit each listener: a message someone could barely hear would be harder to recall. A recording instead of a live voice: a live reader might speed up for some people, and fast speech is harder to take in. The same 2.5-minute length for all: if some heard a longer or shorter message, their recall could rise or fall for reasons unrelated to doodling. Paper for everyone: both groups had something to write the names on.
- **Why the procedure was standardised** (3 marks): a reason, why it matters, and a link to Andrade. For example: with every step fixed, another researcher could run the study again (reason); getting the same pattern again would show the finding is consistent, which is reliability (why it matters); because the exact recording is known, a replication could play the identical message (link). Another route: fixing the procedure removes extraneous variables, so a difference in recall can be put down to whether people doodled.
- **Demand characteristics** (two parts of the procedure, each with how it hid the aim): each person met just one condition, so nobody saw the other group's task or could work out what was being compared; the memory test was a surprise, since participants thought their job was to note the party-goers' names and nothing told them places would be tested; the doodlers were told the number of shapes didn't matter, so they had no reason to treat shading as the thing being measured.
- **Why deception was necessary** (1 mark): without it, people would have made a **deliberate effort to memorise** the names and places, so the scores would reflect effort instead of attention. "To avoid demand characteristics" alone earns nothing: say what they would have done.
- **Uncontrolled variables**: something the design did not remove that may push one condition's scores more than the other's. **Daydreaming**: some people drift off more easily than others; if more of them ended up in one group, the real effect of doodling could be masked. **Knowing someone who shares a party-goer's name**: that person would find the name easy to recall whichever group they were in, so a difference between groups might not be down to doodling. Fixes: invent names nobody is likely to know, or check beforehand whose friends share the names and leave those people out.

5. Measuring recall and the data (6 questions)

1. **Know the two scores**: monitoring = correct names minus false alarms; the memory score = correct names and places recalled minus false alarms.

2. **False alarms** are of two types: **new names** not in the message, and **lures** (names in the message of people who were not coming). Names that were probably just misheard counted as correct, so they are not false alarms.
3. **The incidental information** was the **places**; recall of it was measured by the number of places recalled correctly.

Variations you will meet:

- **Describe the mean and range of shading** (2 marks): interpret each number, don't just repeat it. For the mean: 36.3 is well below the midpoint of the range (56.5), so most of the shading happened at the low end. For the range: even the lowest score was 3, so every doodler shaded something, and the 107-shape gap between lowest and highest shows people differed enormously. Don't compare with the controls (they didn't shade) and don't draw conclusions.
- **How a median would be calculated** (2 marks): take one group's name-recall scores, doodlers or controls, and list them from lowest to highest (1 for linking it to the study); the score in the middle of the list is the median, and with an even number of scores it is halfway between the two middle ones (1 for the method).
- **How the memory score was calculated** (2 marks): the second source of data is the **false alarms** (1), which were **subtracted** from the correct responses (1).

6. Applications and advice (5 questions)

Advice to a person or business (4 marks, one per piece of advice based on the study):

- Base every piece on something Andrade's doodlers actually had or did. Possible points: hand out a sheet of paper; print rows of simple shapes on it; fill the shapes in while listening; say that neatness and speed don't count; leave a strip down the side for jotting key facts; say in advance which details to listen for; afterwards, have a colleague check what was remembered. A dull, quiet room was credited in most mark schemes but refused in June 2025, so use it only as an extra.
- **Naming the task alone earns nothing**: "doodle", "doodling" or "a secondary task" by itself scores 0, and so does "scribble". The March 2026 report lists answers that only said "let the workers doodle" or let people draw their own shapes.
- Don't advise free doodling or drawing your own doodles: Andrade's doodlers shaded given shapes. One mark is allowed for a different named secondary task, such as a fidget toy.
- Don't **justify** the advice unless the question asks; justification earns nothing in the advice part.
- **"Explain one reason for one piece of advice"** (2 marks): give the mechanism and the evidence. "Filling in shapes gives a bored mind just enough to do that it doesn't wander off, and in Andrade's study the group doing this remembered more of a dull message than the group who weren't" (2). A bare "it stops daydreaming" is brief (1).

Applications to everyday life (a 5-mark band):

1. Say **what** the application is and **who** it is for: a teacher whose class loses focus, staff sitting through long meetings, students revising for an exam, a therapist whose clients struggle to concentrate in sessions.

2. Say **how**: hand out sheets of shapes to shade while listening. Don't repeat the same "how" for every application.
3. Keep it **ethical** and **forward-looking** (something you would do, not an explanation of past behaviour). One application in depth, or two or three in less depth, can reach full marks. If the second task isn't doodling (music, a fidget toy), the most you can get is Level 2.

7. The cognitive approach, issues and debates (5 questions)

Assumptions (2 marks each for a full one): information is processed through the same route in everyone, **input** → **process** → **output**, like a computer; people have **individual differences** in cognitive processes such as **attention, memory, language and thinking**, and these explain behaviour and emotion. Naming only one process ("behaviour is explained by memory") is brief (1).

A finding that supports an assumption (1 for the finding, 1 for tying it to an assumption you gave in part (a)): doodlers recalled more names than controls (finding). This backs the idea that differences in behaviour come from differences in cognition, because the only thing separating the two groups was how their attention was being used while they listened (link). Or: the message went in, was processed, and came out as written names. Use only examples from cognitive studies.

"What is meant by the cognitive approach" (up to 2 for the approach, up to 2 for Andrade examples): it looks at mental processes such as memory and attention and treats the mind as an information processor (input → process → output). Examples: the listeners took in a phone message they weren't trying to learn and could still report parts of it later; the group whose attention was helped by shading remembered more.

Individual and situational explanations (define each, then evidence):

- **Individual**: behaviour comes from factors inside the person, such as personality. Evidence: given the same sheet and the same message, doodlers shaded anything from 3 to 110 shapes, so how much someone doodles seems to depend on them; a person who gets bored quickly might need far more to do with their hands than someone who stays settled.
- **Situational**: behaviour comes from the environment or the people around us. Evidence: every participant faced the same tedious setting, a monotonous recorded message heard in a plain room, and it was this setting that gave them a reason to shade; and being handed shapes to shade, which is a feature of the situation, not of the person, went with better recall of names and places than in the control group.

Give at least one piece of **explicit evidence** from Andrade for each side; without it the most is 2 out of 3.

8. Comparing with another study (4 questions)

The 8-mark part of Paper 1 Question 9 or 10: two similarities or differences (or one of each), **4 marks each**, marked in levels:

Level	What it needs
4	A clear explanation, backed by examples from both studies

Level What it needs

3	A clear explanation backed by one study, or brief examples from both
2	A short point with an attempt at an example, or a clear explanation with no examples
1	A short point and no examples

1. **Choose a point you can develop:** the experimental method, the type of IV, the experimental design, quantitative data, the sampling technique, mundane realism, ethics. "Different aims", "different procedures", "both used humans", "both are cognitive" and "both laboratory" stay in Level 1; "different conclusions" or "different number of groups" earns nothing.
2. **State the point, give each study's detail, then explain** what follows from it (for example, what it lets each study claim).
3. **Obey the question's conditions:** if the sample is banned, don't compare samples (the sampling technique is still allowed).

Useful points:

- **Both experiments** (similarity with Pozzulo et al. or Baron-Cohen et al.): Andrade varied one thing on purpose, whether a listener had shapes to shade, and compared recall across the two groups. Pozzulo et al. also compared conditions, such as the type of face to be identified (cartoon or human) and the age of the witness (child or adult); Baron-Cohen et al. compared Eyes Test scores of adults with and without a diagnosis of Asperger syndrome or high-functioning autism. Because each study checked whether a measured outcome changed between conditions, each was looking for cause and effect, though Baron-Cohen's IV was **naturally occurring**, not manipulated (and age in Pozzulo et al. cannot be assigned either).
- **Design** (difference with Pozzulo et al.): Andrade used **independent measures**: each participant met only one condition, doodling or control. In part of Pozzulo et al. the same people were tested more than once (**repeated measures**): each witness faced one line-up that contained the target and another that did not. So Pozzulo et al. could compare a person with themselves on that variable, while every comparison in Andrade was between different people, which leaves room for participant variables.
- **Quantitative data** (similarity): Andrade counted names and places recalled; Baron-Cohen et al. scored the Eyes Test; Pozzulo et al. recorded the choices made from line-ups. Numbers let the groups be compared objectively.
- **Mundane realism** (similarity, both low): a mock telephone message and given shapes to shade; Pozzulo's line-ups of cartoon and human faces; Baron-Cohen's task of judging emotions from pictures of eyes alone.
- **Cognitive skill measured: recall versus recognition** (difference with Pozzulo et al.): Andrade measured **free recall**: after a delay, participants had to write down, with no prompts, the names and places they had heard in the message. Pozzulo et al. measured **recognition**: participants were shown a line-up of faces and had to pick out the target they had seen, or say the target was not there, and the study looked at false positive choices. So Andrade's DV depended on retrieving information from memory unaided, while Pozzulo's gave participants cues to choose from, which makes it possible to make a wrong pick (a false

positive) that free recall cannot produce in the same way. The two studies therefore tell us about different parts of memory: how attention during learning affects what can later be recalled, versus how accurately a seen face is recognised.

- **Manipulated versus naturally occurring IV** (difference with Baron-Cohen et al.): in Andrade's study the researcher **created** the two conditions, randomly allocating participants to shade shapes or not while listening. In Baron-Cohen et al. the IV could not be assigned: it was whether a participant already had a diagnosis of Asperger syndrome or high-functioning autism, so the groups existed before the study began. So Andrade can be more confident that doodling caused the better recall, because random allocation spreads other differences between people across both groups, while in Baron-Cohen et al. the groups may also have differed in other ways, which could explain some of the difference in Eyes Test scores. (Comparing the aims or the psychology investigated is capped at Level 1, June 2025.)
- **Task** (difference with Pozzulo et al. or Baron-Cohen et al.): Andrade's was an **auditory** task (listening); the others were **visual** (faces, eyes). It can be **capped at Level 1** (June 2025 mark scheme; March 2024 allowed up to Level 3), so choose one of the differences above instead.

Worked examples

Example 1

From the study by Andrade (doodling):

(a) Outline what happened to a participant in the **control** group, from entering the room to the end of the study. [4]

(b) Explain why the place names in the telephone message were useful to the researcher. [2]

(a) The participant was taken into a visually dull, quiet room (1). They listened to a dull, recorded telephone message about a party and wrote down the names of the people who were coming, but were not given shapes to shade (1). Afterwards the researcher chatted with them for about a minute (1). They were then given a surprise test, writing down the names of the party-goers and the places mentioned (1), and finally they were debriefed and asked whether they had expected a memory test (a further creditworthy point).

(b) Participants were never asked to listen for places, so recall of the places measured incidental information that nobody was trying to notice (1). If doodlers still recalled more places, as they did, doodling must have improved general attention to the whole message, not just effort on the names task (1).

Example 2

In the study by Andrade (doodling), the recall of names was scored as the number of correct names minus the number of false alarms.

(a) A participant in a replication writes down 9 names in the surprise test. Six are party-goers, one is a person in the message who was not coming, and two are names that were never in the message. Calculate this participant's score. [2]

(b) Explain why false alarms were subtracted, instead of just counting the correct names. [2]

(a) False alarms = 1 lure + 2 new names = 3 (1). Score = 6 – 3 = 3 (1). (These are made-up numbers for practice, not data from the study.)

(b) Someone could score highly just by writing down lots of names, including guesses (1). Subtracting false alarms means the score shows how accurately the participant attended to the message, so it is a more valid measure of concentration (1).

Example 3

Mei is taking an online course. She watches long pre-recorded video lectures, and finds her mind wanders so that she forgets what the lecturer said.

(a) Using the study by Andrade (doodling), suggest what Mei could do while watching the lectures. [4]

(b) Explain one reason for one of your suggestions. [2]

(a) Mei could print a sheet of paper before each lecture (1) with rows of shapes, such as squares and circles, already on it (1). While listening she could shade the shapes in, without worrying about how neat or quick she is (1). She could leave a margin to note down the key points she is listening out for (1). She could also decide in advance which pieces of information to listen out for, such as dates or definitions (a further creditworthy point).

(b) Shading is so easy that it takes almost no thought, but it gives Mei just enough to do that her alertness stays up and her mind has less chance to drift into daydreams, leaving more of her attention for the lecture (1). Andrade found exactly this pattern: the listeners given shapes to fill in remembered more names and places from a tedious phone message than the listeners who had none (1).

Note what is missing: no "Mei should doodle" on its own (0 marks), and no free drawing of her own pictures.

Example 4

Evaluate the study by Andrade (doodling) in terms of two strengths and two weaknesses. At least one of your evaluation points must be about ethics. [10]

Plan: strengths are standardisation (reliability) and controls (internal validity); weaknesses are ethics (the named issue) and generalisability. Each paragraph has the point, two details from the study and why it matters.

Strength 1: standardisation and reliability. The procedure was standardised, so it could be repeated exactly. Every participant heard the same recorded telephone message, spoken at 227 words per minute and lasting 2.5 minutes, and had the same instruction to write down only the people coming to the party. Because the message could not vary in speed or content between people, another researcher could replay it and see whether doodlers again recall more, so the reliability of the finding can be tested.

Strength 2: controls and internal validity. Andrade controlled variables that could otherwise explain the difference. Both groups sat in the same visually dull room, both had just finished another study so they were similarly bored, and both had paper; only the doodlers had shapes to shade. Participants were randomly allocated and the recall order was counterbalanced. So it is likely that the IV, doodling, caused the better recall of names and places.

Weakness 1: ethics (the named issue). Participants were deceived: they were told their task was to write down the party-goers' names and not told there would be a memory test. So they could not give fully informed consent to what was actually measured. This deception was needed (if they had known, they would have tried to memorise the names and places), and they were debriefed and asked whether they had suspected a test, so the harm was small. But it still breaks the guideline, so it is a weakness.

Weakness 2: generalisability. The sample was 40 members of one research unit's participant panel, recruited by opportunity, and only 5 were men. People who volunteer for a psychology panel may have similar interests and motivation, and the findings about concentration may apply mainly to women. The task was also artificial: a mock message in a laboratory, with shapes given to shade, not the free doodling people do in real meetings, so the results may not generalise to everyday life.

How it would be marked: four points of equal depth, each with two or more specific details and an explanation of why it matters, including the named issue: the top level (9–10 marks). Leaving out ethics would cap it at 6.

Common mistakes

- **Retelling the aim and results when asked for "the psychology being investigated":** describe attention, arousal, boredom and dual-task processing in general; only one mark goes to an example from Andrade.
- **Giving a result as a conclusion.** "The doodlers recalled more names" is a result (0 marks as a conclusion). Say what it shows about people: doodling helps concentration by reducing daydreaming.
- **Writing "doodle" as advice.** On its own it earns nothing. Describe what to do, as in the procedure: shade pre-printed shapes, ignore neatness, keep a margin for notes. Don't advise drawing your own doodles.
- **Calling the design repeated measures.** It was independent measures: each person was either a doodler or a control.
- **Writing about materials when the procedure is asked for.** Say what the participant did, with at least one doodling step for a doodling-condition question.
- **Confusing doodling with daydreaming.** Daydreaming is the uncontrolled variable that doodling may reduce; they are not the same thing.
- **"To avoid demand characteristics" with nothing more** for why deception was needed. Say they would have deliberately memorised the names and places.
- **Giving the total sample (40) for the doodling group (20),** or numbers from another core study.
- **Unequal or generic evaluation points,** a missing named issue, or real-world applications in a 10-mark evaluation.

- **Comparing aims or procedures**, or comparing with a study that isn't from the cognitive approach, in a comparison question.

How to get the marks

- **"Identify" and "State"**: a word, a number or a short phrase is enough. If the question wants one thing, write one, because only your first answer is read.
- **"Outline"**: the main point plus a short addition that makes it specific to Andrade. A 2-mark design answer names the design and says how it worked here; a 2-mark conclusion makes a general claim and gives its reason.
- **"Describe"**: marks go to separate, accurate points, so write at least as many points as there are marks, with the study's numbers where they fit.
- **"Explain"**: give the reason, then tie it to something that happened in Andrade's study. The tie is usually the second mark.
- **"Suggest"**: there is no single right answer. Propose something that makes sense for the study or scenario, then add a detail, such as what the problem would do to the results or how your fix would work.
- **Advice and applications**: each piece of advice is a concrete step taken from the procedure. An application says who would use it, where, and what they would actually do, and it must be ethical and something to do in future.
- **Data questions**: interpret. Say what the numbers tell you about the participants; writing the figures out again scores nothing.
- **Comparisons** (8 marks): for each point, name it, show it in both studies, then say what follows from it.
- **"Evaluate ... two strengths and two weaknesses"** (10 marks): four balanced paragraphs with the named issue among them, each built on details from Andrade, and no retelling of the study.

Quick check

1. State how many participants were in each group, and how many of the whole sample were men.
2. The message lasted 2.5 minutes at 227 words per minute. Calculate roughly how many words it contained.
3. Using the specimen mark scheme means (names 5.1 and places 2.4 for doodlers; 4.0 and 1.8 for controls), calculate each group's total mean recall, and how many per cent more the doodlers recalled.
4. A researcher repeating the study records these (made-up) numbers of names recalled by seven controls: 4, 7, 3, 5, 6, 2, 5. Find the median and the range.
5. Explain how the study supports the situational explanation of behaviour.

Answers

1. **20** in the doodling group and **20** in the control group; **5** men (and 35 women).
2. $227 \times 2.5 = 567.5$, so about **570 words** (568 to the nearest word).
3. Doodlers $5.1 + 2.4 = \mathbf{7.5}$; controls $4.0 + 1.8 = \mathbf{5.8}$. $\frac{7.5 - 5.8}{5.8} \times 100 = 29.3$, so the doodlers recalled about **29% more**.
4. In order: 2, 3, 4, 5, 5, 6, 7. The middle (4th) score is the median, **5**. Range = $7 - 2 = \mathbf{5}$.
5. The situational explanation puts the cause of behaviour outside the person. In Andrade's study the researcher controlled the setting: everyone heard the same tedious recording, and only the setting differed between the groups, since one group was handed shapes to shade. That outside change alone went with better recall, as the doodling group recalled more names and places than the controls.

Past questions to try

- 9990/12/O/N/25 Q8: advice to a teacher, then a reason for one piece of advice.
- 9990/12/F/M/25 Q7: the procedure for a participant in the doodling condition.
- 9990/23/M/J/24 Q2: what the mean and range of shading show.
- 9990/13/O/N/23 Q8: individual and situational explanations, with evidence.