Dement and Kleitman (1957)

Lesson 1.1.1 | Sleep and dreams | Cambridge 9990, 2027

Main idea: physiological recordings can help investigate dreaming, but dream experience is still inferred from what people remember and report.

1. Concepts and background

The biological approach explains behaviour, thoughts and emotions through the brain, hormones, genetics and evolution, interacting with other factors. This study linked eye movements and brain activity with dream reports; it did not directly test genes or hormones.

REM: rapid-eye-movement sleep, with characteristic EEG activity. **NREM:** non-rapid-eye-movement sleep; not uniformly deep sleep. **EEG:** brain electrical activity recorded through scalp electrodes. Eye electrodes record eye-movement-related potentials.

Dreaming: subjective experiences during sleep. **Dream recall:** remembering and reporting content after awakening. **Ultradian rhythm:** a biological cycle shorter than 24 hours, recurring within a day. Earlier research linked REM with dream reports; this study sought stronger, more objective evidence.

2. Three aims

1. Compare dream recall after REM and NREM awakenings.
2. Relate perceived dream duration to recorded REM duration.
3. Relate eye-movement patterns to visual dream content.

3. Sample and procedure

Nine adults: seven male, two female. Five were studied intensively; four provided limited confirmatory data. Total: 61 participant-nights and 351 awakenings. Recruitment was not reported; do not invent a sampling technique.

Participants ate normally but avoided alcohol and caffeine that day. They slept near their usual bedtime in a quiet, dark laboratory room. Scalp and eye electrodes recorded continuously; researchers monitored next door. A doorbell woke participants, who reported into a recorder before researcher questioning.

Recall criterion: a coherent, fairly detailed account of dream content. Saying "I dreamed" without content, or reporting only vague fragments, did not count as recall.

4. Research methods and controls

Experimental comparisons used repeated measures: the same people supplied different conditions. REM/NREM was the sleep-state IV; recall/no recall was the DV. In the duration test, the IV was 5/15 minutes of REM and the DV was judgement accuracy. Correlations and self-report/interviews were also used.

Participants were not told the current eye-movement state. Reporting before contact reduced suggestion. Awakening schedules varied: random-number tables, fixed patterns or researcher judgement. They were not identical for everyone.

Three investigations: key evidence

Results, procedures and conclusions to remember

1. REM versus NREM dream recall

Awakened from	Recall	No recall	Total
REM	152	39	191
NREM	11	149	160

Recall occurred after about **80% of REM** awakenings versus **7% of NREM** awakenings. These are repeated awakenings, not different people. REM was strongly associated with recall; this does not establish REM-only dreaming or causation.

Ultradian rhythm: REM recurred about every 92 minutes on average; individual mean intervals were 70-104 minutes. Uninterrupted REM periods lasted 3-50 minutes (mean about 20), tending to lengthen later in the night. Many other periods were cut short experimentally.

2. Dream duration

After a randomly selected 5 or 15 minutes of REM, participants chose which duration matched their dream. Earlier attempts to estimate to the nearest minute were too difficult.

5 minutes: 45 correct, 6 incorrect (about 88% accurate).
15 minutes: 47 correct, 13 incorrect (about 78% accurate).

Judgements broadly matched recorded time, but were not always correct. Longer REM periods also tended to accompany longer reports, measured in words. These two measured variables are **co-variables**, not manipulated IVs.

Positive correlations: DN +0.60; IR +0.68; KC +0.40; WD +0.71; PM +0.53. Word count is a proxy: talkativeness, reporting style and forgotten details affect it. Neither correlation nor accurate forced choice establishes exact dream timing.

3. Eye-movement patterns and visual content

Participants were awakened after a predominant pattern lasted at least one minute, then described the dream just before awakening. There were 35 awakenings in this investigation.

Pattern	Awakenings	Reported visual activity
Mainly vertical	3	Looking up/down: ladders or basketball.
Mainly horizontal	1	Watching two people throw tomatoes at each other.
Little/no movement	10	Watching distant activity or a fixed object.
Mixed movements	21	Nearby people/objects and varied activity.

Some recorded patterns corresponded to dream imagery. Pure horizontal/vertical examples were rare, and content relied on subjective recall. The evidence does not support decoding every dream from eye movements.

Evaluation and exam reminders

Explain how each study detail affects the evidence

1. Strengths

Objective recording: continuous brain/eye measurements reduced reliance on memory when identifying sleep state. Dream content itself remained subjective.
Controls and replicability: alcohol/caffeine restrictions, a controlled room and a consistent initial-report procedure reduced some unwanted influences and made replication easier.
Repeated measures: comparing conditions within the same people reduced stable individual differences. Quantitative counts supported comparisons; qualitative reports explained content.

2. Limitations

Generalisability: only nine adults, with most intensive data from five and an uneven sex distribution. Many awakenings do not create a large representative sample.
Ecological validity: electrodes, the laboratory and repeated awakenings may affect natural sleep and recall. However, REM regularity resembled earlier findings from uninterrupted sleep.
Measurement and interpretation: forgetting can produce no recall; word count depends on reporting style; matching dream content to eye patterns involves interpretation. Only one horizontal and three vertical observations weaken generalisation.

3. Ethics and issues/debates

Repeated awakenings raise welfare concerns; dream reports may contain private information. WD was told awakenings would occur only when recordings indicated dreaming, but REM/NREM awakenings were mixed: this involved deception.

Consider informed consent, withdrawal, confidentiality and debriefing as safeguards. The paper does not fully report these, so do not claim they were all present or absent.

Recurring REM supports a biological account, but nature and nurture were not directly compared. Individual rhythms varied, while laboratory conditions may also influence sleep. The method could help investigate stress or drugs, but this study demonstrated no treatment. It provides no direct evidence about children or non-human animals.

Common errors: no recall does not mean no dream; not every REM awakening produced recall; association does not prove causation; 351 awakenings do not mean 351 participants; report word count is not exact dream duration.

Hint: Build evaluation as point → specific study evidence → consequence for validity, reliability or generalisability.

Hassett et al. (2008): Monkey toy preferences

Lesson 1.1.2 | Concepts and methods

1. Psychology and background

The biological approach explains behaviour through brain processes, hormones, genes and evolution, interacting with experience. **Socialisation** is learning expectations through social experience; **hormones** are chemical messengers. **Play** includes exploring and manipulating objects.

Children show sex differences in toy preferences, but biology and gendered socialisation overlap. Rhesus monkeys do not receive the same explicit human toy teaching. Earlier monkey work offered toys separately; simultaneous access permits a more direct preference comparison.

2. Aim and sample

Test sex differences in interaction with wheeled and plush toys, and compare the pattern with earlier human findings. No children were newly tested.

The established troop contained 135 monkeys. Fourteen with prenatal hormone-treatment histories and 39 newborn infants were excluded, leaving 82 eligible animals. The final analysed sample was **34: 11 males and 23 females**, after excluding animals with too little coded behaviour. This was an available captive group, not a random population sample.

3. Design and procedure

A field experiment with structured observation in the familiar enclosure. Toy type was within animals; sex was a natural between-animal comparison. DVs were frequency and duration of toy-directed behaviours.

Seven planned 25-minute trials offered one wheeled and one plush toy simultaneously, 10 metres apart. Positions were counterbalanced. Separate cameras recorded interaction; one trial ended seven minutes early when a plush toy tore.

Operationalisation: preference meant greater recorded interaction with one category. It did not mean that a monkey understood a toy as being "for boys" or "for girls".

Hassett et al. (2008): Monkey toy preferences

Lesson 1.1.2 | Evidence and interpretation

1. Recording behaviour

A fixed checklist included touch, hold, sit on, carry, drag, manipulate, turn, sniff, mouth, destroy, jump away and throw. Continuous actions had start/end times; brief actions were counted. Two observers reached consensus on identity and behaviour.

Counts and durations were divided by each animal's number of participating trials, then combined across coded behaviours. Frequencies count occurrences; durations measure time. They are different outcomes.

2. Main findings

Comparison	Frequency result
Males: wheeled versus plush	More interaction with wheeled toys.
Females: wheeled versus plush	No significant category preference.
Males versus females: wheeled	No significant frequency difference.
Males versus females: plush	Females interacted more frequently.

Mean duration (minutes)	Wheeled	Plush
Males	4.76	0.53
Females	1.27	1.49

Males spent significantly longer with wheeled toys than plush toys. Females showed no significant duration preference. Between-sex duration differences for either toy type were not significant.

3. Individual variation and interpretation

Individual preferences: males 73% wheeled, 9% plush, 18% no significant preference; females 39% wheeled, 30% plush, 30% no preference (rounding applies). Group averages do not describe every animal.

Higher-ranking females interacted more; age did not show significant differences. Authors proposed biologically influenced activity preferences shaped by social experience. **Hormones were not manipulated in this toy study**; sex differences alone cannot establish a hormonal cause.

Hassett et al. (2008): Monkey toy preferences

Lesson 1.1.2 | Evaluation and connections

1. Strengths

Direct choice: both categories were available together, improving the interpretation of relative preference.
Systematic measurement: video and operational definitions allowed actions to be revisited and coded consistently.
Familiar setting: animals remained within their established social environment, reducing some disruption.

2. Limitations

Selective sample: only sufficiently interactive animals contributed to the final analysis; one captive troop limits generalisation.
Confounds: toys differed in size, colour and shape as well as wheels/plush material. Rank and group access may affect opportunities to play.
Reliability: consensus is useful, but is not independent blind coding with a reported agreement coefficient.

3. Animal ethics

Reported care included group housing, outdoor and temperature-controlled indoor areas, continuously available water, normal food and approved oversight. Animals were not forced to approach toys. These details support welfare, but material safety and social access still need evaluation; the torn toy was a potential hazard, not proof of injury.

Consider replacement, species choice, justified numbers, harm/benefit and procedures. A human study cannot directly answer whether non-human preferences arise without explicit human toy teaching, but human transfer remains uncertain.

4. Debates and application

Nature/nurture: findings suggest a possible biological contribution, while social experience and preferences may interact. **Individual/situational:** sex and individual variation combine with group rank and access. The study can inform play research; it cannot prescribe toys for an individual child.

> Remember: 135 in the troop, 82 eligible, 34 analysed. "Females were more variable" is not the same as "females preferred plush toys".

Hint: State whether a result concerns frequency, duration, within-sex preference or a between-sex comparison before interpreting it.

Hölzel et al. (2011): Mindfulness and brain scans

Lesson 1.1.3 | Concepts and methods

1. Psychology and aim

Mindfulness: awareness of the present moment with a compassionate, non-judgemental stance. **Localisation:** different brain regions contribute to different functions. **Neuroplasticity:** the nervous system can change with experience.

Earlier cross-sectional comparisons of meditators could reflect pre-existing differences. This study followed beginners to investigate gray-matter concentration changes after eight weeks of Mindfulness-Based Stress Reduction (MBSR). Hippocampus and insula were planned regions of interest; whole-brain analysis was exploratory.

2. Sample and design

Final scan sample	MBSR	Waiting-list control
Participants	16: 6 men, 10 women	17: 11 men, 6 women
Mean age	38 years	39 years

Healthy, medication-free volunteers aged 25-55 with little meditation experience. MBSR participants were recruited from existing courses, were right-handed and MRI-eligible. Groups were not randomly allocated.

A controlled longitudinal design: group was between participants; pre/post time was within participants. Outcome: regional gray-matter concentration measured using structural MRI and voxel-based morphometry (VBM). FFMQ self-report and home-practice records supplied additional data.

3. Procedure

MBSR involved eight weekly sessions of about 2.5 hours, a 6.5-hour day in week six, and body scan, mindful yoga and sitting meditation. Guided home practice was prescribed for 45 minutes daily, with informal mindful activities.

MRI scans occurred within two weeks before/after the course; controls were scanned at a comparable interval of about two months. VBM compared small units of brain images. Gray-matter concentration is an MRI-based tissue estimate. Structural MRI measures anatomy, not direct task performance.

Hölzel et al. (2011): Mindfulness and brain scans

Lesson 1.1.3 | Evidence and interpretation

1. Brain results

Analysis	Finding
Planned: left hippocampus	Gray-matter concentration increased after MBSR; controls showed no significant change in this cluster.
Planned: insula	No significant predicted increase.
Exploratory whole brain	Increases in posterior cingulate cortex, left temporo-parietal junction and cerebellar clusters, including a vermis/brainstem cluster.

The hippocampus is discussed in relation to learning/memory; posterior cingulate to self-referential processing; temporo-parietal junction to perspective-taking; cerebellar areas to cognitive/emotional processes. These functional explanations are interpretations, not functions directly tested here.

2. Mindfulness and practice

The Five Facet Mindfulness Questionnaire (FFMQ) has 39 items rated 1-5: observing, describing, acting with awareness, non-judging and non-reactivity. Usable pre/post questionnaire data came from **14 people per group**, not the full scan sample.

Observing, acting with awareness and non-judging improved significantly in the MBSR group. Describing and non-reactivity did not show significant group-by-time effects.

Practice measure	Reported amount
Prescribed formal practice	45 minutes per day
Actual mean formal practice	27 minutes per day
Mean total over eight weeks	22.6 hours

Reported practice time and changes in FFMQ scores were not significantly correlated with the identified brain changes. The study did not establish a simple more-practice/more-change dose relationship.

Conclusion: MBSR participation was associated with regional structural changes consistent with experience-dependent plasticity. Increased concentration in a memory-related region does not prove improved memory.

Hölzel et al. (2011): Mindfulness and brain scans

Lesson 1.1.3 | Evaluation and connections

1. Strengths

Longitudinal comparison: the same people were scanned before and after, reducing the problem of relying only on pre-existing group differences.
Objective measure: standardised MRI/VBM reduces reliance on self-report for brain structure.
Control interval: a waiting-list comparison helps assess changes beyond time alone.

2. Limitations

Selection: motivated course volunteers were not randomly allocated; the small, healthy and educated sample limits generalisation.
Inactive control: group contact, expectations, exercise and other components were not matched by an alternative course.
Interpretation: MRI concentration is not a direct measure of memory, empathy or emotional regulation. No long-term scan follow-up established permanence.

3. Ethics

Written informed consent and ethics-board approvals were reported. MRI screening addressed safety. Two MBSR participants withdrew after discomfort during the first scan, demonstrating that discomfort can occur even with non-invasive methods. Brain images and questionnaires require confidentiality and privacy.

4. Debates and applications

Nature/nurture: experience-associated structural change shows that biological characteristics need not be fixed. It does not quantify genetic influence or prove genes irrelevant.
Individual/situational: motivation and self-selection may combine with the course environment and practice.
Application: findings motivate further study of training and plasticity; clinical effectiveness needs separate evidence.

> Remember the non-findings: no significant insula increase; no significant practice-time/brain-change correlation; no direct test of improved memory.

Hint: Separate the brain measurement, the psychological function associated with that region, and any actual behavioural test. Only the first was directly measured here.

Andrade (2010): Doodling

Lesson 1.2.1 | Concepts and methods

1. Psychology and background

The cognitive approach assumes people share an input-process-output route, often compared with a computer. Individual differences in attention, language, thinking and memory help explain behaviour and emotion.

Attention: selecting and maintaining processing of relevant information. **Memory:** retaining and retrieving information. A boring task can encourage daydreaming, which may compete with processing the main message. A simple extra activity might regulate arousal or reduce mind-wandering.

2. Aim and participants

Test whether doodling helps or hinders monitoring and later recall of a monotonous message. Forty adults aged 18-55 were recruited opportunistically from an MRC participant panel after completing another experiment. Most were women.

Random allocation produced two groups of 20: doodling (3 men) and control (2 men). Opportunity sampling concerns recruitment; random allocation concerns assignment to conditions. They are not the same procedure.

3. Design and variables

Laboratory experiment with independent groups. **IV:** shade printed squares/circles while listening, or listen without shading. **Monitoring DV:** correct target names minus false alarms. **Recall DV:** correct names and places remembered later, minus false alarms.

4. Procedure and controls

Each person listened in a dull, quiet room to the same 2.5-minute mock telephone message, delivered monotonously at about 227 words per minute. Eight people would attend a party; other names, a cat and eight places were also mentioned.

Participants wrote names of definite/probable attendees. Doodlers shaded printed shapes, with no need for speed or neatness. After a one-minute conversation, a surprise test asked for names and places; recall order was counterbalanced.

Monitoring occurred during the message. Recall occurred afterwards. Shading supplied shapes standardised the extra task, but did not reproduce every type of spontaneous doodling.

Andrade (2010): Doodling

Lesson 1.2.1 | Evidence and interpretation

1. Monitoring performance

Mean monitoring measure	Doodling	Control
Correct names / 8	7.8	7.1
Score adjusted for false alarms	7.7	6.9

A false alarm is an incorrect response treated as a target. Subtracting these responses prevents inaccurate guessing from inflating performance. Consistent rules allowed plausible mishearings to count as correct.

2. Surprise recall

Mean adjusted recall	Doodling	Control
Names	5.1	4.0
Places	2.4	1.8
Combined	7.5	5.8

The reported relative recall advantage was **29%**. Both groups remembered the monitored names better than incidental places. The figures are group means, not the score of every person.

Doodlers shaded a mean of 36.3 shapes (range 3-110). Seven people suspected a memory test: three doodlers and four controls. Excluding them did not change the broad result.

3. What may explain the result?

Reduced daydreaming: a light secondary task might use resources that would otherwise support mind-wandering.
Arousal regulation: shading might maintain alertness during boredom.
Neither mechanism was directly measured, so the experiment does not establish which caused the performance difference.

> Conclusion: simple shape shading improved monitoring and recall in this short, monotonous auditory task. It does not establish that all drawing, or all multitasking, helps learning.

Hint: State which score you mean: correct monitoring, false-alarm-adjusted monitoring, names recall, places recall or combined recall.

Andrade (2010): Doodling

Lesson 1.2.1 | Evaluation and connections

1. Strengths

Random allocation: reduces systematic differences between the two conditions.
Standardisation: one recorded message and consistent scoring improve comparability and replicability.
Counterbalancing: names-first/places-first recall reduces a consistent order effect.
Surprise test: assesses incidental memory rather than only deliberate rehearsal.

2. Limitations

Restricted sample: a mostly female adult panel sample may not represent children, students in a full lesson or people in different settings.
Task validity: shading provided shapes is different from creative drawing; a short audio message differs from complex learning.
Mechanism: attention was inferred from performance, while daydreaming and arousal were not measured directly.

3. Ethics

Participants were told they did not need to remember the material, allowing surprise recall to be tested. This misleading instruction limits fully informed consent. The researcher debriefed participants, explained the deception, apologised and asked about suspicion. The extra task was mild, but withdrawal and confidentiality still matter.

4. Application and debates

Everyday application: a low-demand concurrent activity might help during some dull listening tasks. The study did not test long-term grades, children's outcomes or unrestricted drawing.
Individual/situational: attention can differ between people; message monotony and the shading condition are situational factors.
Nature/nurture: changing the task altered performance, but the origins of individual attention differences were not tested.

> Common mistake: "Doodling prevented daydreaming" states an untested mechanism as a finding. Write "reduced daydreaming was a proposed explanation".

Hint: Evaluate an application by comparing the proposed activity, learners and learning outcome with the task actually tested.

Baron-Cohen et al. (2001): The Eyes Test

Lesson 1.2.2 | Concepts and methods

1. Psychology and aims

Theory of mind: attributing mental states to oneself and others. **Mentalising** includes inferring beliefs, intentions and feelings. **Social sensitivity** involves noticing subtle mental-state cues. These are cognitive processes; one task does not measure every aspect of empathy.

The 1997 test had ceiling and discrimination problems. A revised test aimed to detect subtler differences, compare autistic adults with comparison groups, examine sex differences and test the relationship with Autism-Spectrum Quotient (AQ) scores. The paper used the historical diagnostic terms AS/HFA.

2. Improvements to the test

Twenty-five photographs became 36 scored items; two choices became four (chance success fell from 50% to 25%). Complex mental states, closer distractors, balanced male/female faces and removal of gaze-direction shortcuts improved discrimination. A glossary reduced vocabulary confusion.

3. Participants

Group	Sample
1: historical AS/HFA group	15 adult men, support-group adverts; mean age 29.7, mean IQ 115.
2: community comparison	122 adults, classes/library users; mean age 46.5 for 88 with age data.
3: students	103 Cambridge undergraduates: 53 men, 50 women; mean age 20.8.
4: IQ-matched comparison	14 adults; mean age 28.0, mean IQ 116.

4. Design and procedure

Independent-group comparisons used naturally occurring diagnosis and sex, not randomly assigned traits. The original paper describes individual quiet-room testing with a glossary. Participants selected the best mental-state word for each photograph of the eye region. Groups 1, 3 and 4 completed AQ; Group 1 also judged the faces' sex.

Baron-Cohen et al. (2001): The Eyes Test

Lesson 1.2.2 | Evidence and interpretation

1. Test construction and measures

Eight pilot judges checked target words and distractors. Larger item analysis removed four of 40 candidate photographs, leaving 36. Each item offered four words; one target counted as correct. AQ is a self-report trait measure scored 0-50, distinct from the performance test.

2. Eyes Test scores

Group	Mean / 36	Standard deviation
1: AS/HFA	21.9	6.6
2: community	26.2	3.6
3: students	28.0	3.5
4: IQ-matched	30.9	3.0

The historical AS/HFA group scored lower on average than the comparison groups. Members of every group varied; mean differences do not classify every individual.

3. AQ and other findings

AQ group	Usable n	Mean / 50
1: AS/HFA	14	34.4
3: students	79	18.3
4: IQ-matched	14	18.9

Higher AQ scores tended to accompany lower Eyes scores; the combined correlation was **-0.53**. IQ was not significantly correlated with Eyes performance in the available measured sample.

Female Eyes means were higher, but this was a non-significant trend. Student AQ means were 19.5 for men and 16.6 for women, a reported significant difference. Every AS/HFA participant scored at least 33/36 on sex recognition.

Conclusion: the revised task detected subtle social-cognitive differences. Successful sex recognition alongside harder mental-state judgements argues against a simple inability to process eye photographs, but does not measure all everyday social understanding.

Baron-Cohen et al. (2001): The Eyes Test

Lesson 1.2.2 | Evaluation and connections

1. Strengths

Systematic revision: pilot criteria and item analysis improved sensitivity and reduced easy shortcuts.
Comparisons: the IQ-matched group addressed general intelligence as an alternative explanation.
Glossary and control task: reduced vocabulary misunderstanding and checked basic processing of the same stimuli.

2. Limitations

Ecological validity: static eye photographs and four supplied words omit voice, movement, body language and social context.
Generalisation: the AS/HFA group contained only 15 men, limiting transfer across sex, age and ability.
Construct validity: language, cultural knowledge and consensus-selected target words may influence scores. This is one component of mentalising, not a complete empathy assessment.

3. Ethics and interpretation

Diagnosis and social-cognition scores are sensitive; voluntary consent, respectful treatment and protection of identifiable data matter. Do not invent modern safeguards not described in the report. A group difference should not be framed as a judgement of a person's worth or entire social ability.

4. Application and debates

Application: the task can support research on social sensitivity; it is not a stand-alone diagnosis and no treatment was tested.
Individual/situational: cognitive characteristics differ, but restricted cues and word choices also shape performance.
Nature/nurture: diagnostic comparisons did not isolate genes, maturation or experience as the cause.

> Three distinctions: Eyes score is not AQ; a negative correlation is not causation; a female mean advantage was not a significant Eyes Test sex difference here.

Hint: Keep test sample sizes separate from usable AQ sample sizes. For procedure questions, the original study describes individual quiet-room testing rather than an online administration.

Pozzulo et al. (2011): Line-ups

Lesson 1.2.3 | Concepts and methods

1. Psychology and aims

Eyewitness testimony: evidence based on a witness's memory. A **target** is the person/character originally seen; a **foil** is an alternative face. In a target-present line-up, correct identification means selecting the target. In a target-absent line-up, selecting any face is a false positive.

Children may choose a face because they think adults expect an answer, as well as because of memory limits. Familiar cartoons should make recognition easier. The aim was to investigate whether poor recognition alone explains children's target-absent errors.

2. Participants and design

Sample	Children	Adults
Number	59	53
Ages	4-7; mean 4.98	17-30; mean 20.54
Sex	21 female, 38 male	36 female, 17 male
Recruitment	Three private schools	University psychology pool

Laboratory-style experiment with age as a naturally occurring between-group factor. Participants encountered both cartoon and human targets. Target presence/absence was randomised across participants. Outcomes were correct identification and correct rejection, supplemented by interviews/questionnaires.

3. Materials and procedure

Four silent six-second clips showed Dora, Diego, a woman brushing her hair and a man putting on a coat; each included a 2-3-second close-up. Four-face arrays contained target plus three foils, or four foils. A silhouette allowed a "not there" response.

Children were tested individually at school after rapport-building crafts; interviews created an approximately two-minute delay, then children pointed to a choice. Adults completed the task in a laboratory and wrote responses. Adults supplied their own familiarity/demographic information; parents supplied children's information.

Pozzulo et al. (2011): Line-ups

Lesson 1.2.3 | Evidence and interpretation

1. Controls

Instructions stated that the target might be absent and demonstrated the silhouette. Videos and arrays were standardised; clip order and target positions varied. Similar foils were selected using ratings. Child-testing researchers avoided uniforms/lab coats that might heighten authority cues.

2. Target-present: correct identification

Target type	Children	Adults
Familiar cartoons	99%	95%
Unfamiliar humans	23%	66%

When the cartoon target was present, children could identify it almost perfectly. Their unfamiliar-human identification was much lower than adults'. This supports a role for familiarity/recognition, with stimulus-type limits.

3. Target-absent: correct rejection

Target type	Children	Adults
Familiar cartoons	74%	94%
Unfamiliar humans	45%	70%

These percentages are **correct rejection**, not false positives. A lower rejection rate means more wrong face choices. Children rejected fewer absent line-ups correctly for both target types.

4. Interpretation

Near-perfect present-cartoon identification did not eliminate children's absent-cartoon errors. Poor recognition alone is therefore insufficient as an explanation. Perceived pressure to choose may contribute, alongside cognitive factors.

> Conclusion: recognition and social responding can interact. The experiment did not independently manipulate social pressure, so it cannot establish pressure as the sole cause of false positives.

Hint: Before describing a percentage, identify target presence/absence and whether accuracy means selecting a face or choosing the silhouette.

Pozzulo et al. (2011): Line-ups

Lesson 1.2.3 | Evaluation and connections

1. Strengths

Within-person target comparison: each participant encountered cartoons and humans, reducing stable participant differences.
Controlled presentation: short clips, similar foils, standard instructions and varied order/position improved consistency.
Multiple measures: identification, rejection, recall and familiarity information helped distinguish possible explanations.

2. Limitations

Confounded familiarity: familiar cartoons differ from unfamiliar human photographs in more than familiarity.
Group procedures: children spoke/pointed at school, while adults wrote in a laboratory. Age was not the only difference.
Ecological validity: benign six-second clips and a short delay differ from a stressful crime and later identification.

3. Research with children

Written parental consent was obtained. Children were told they could change their minds without getting into trouble. Crafts built rapport; researchers monitored fatigue, anxiety and stress. Everyday clips reduced exposure to distressing material; crayons and a colouring book were given afterwards.

Parental permission does not replace the child's willing agreement or ongoing right to stop. Rewards and adult authority must not create pressure to participate. Developmentally suitable instructions improve both welfare and measurement validity.

4. Applications and debates

Application: make rejecting an absent target a clear and acceptable option in identification procedures. This study did not test every police practice.
Individual/situational: age-related cognition and familiarity combine with expectations in an adult-led task.
Nature/nurture: age differences do not separate maturation from accumulated experience.

> Do not confuse identifying a known target with rejecting a target-absent array. Being able to recognise someone does not guarantee freedom from false positives.

Hint: A developed evaluation links a concrete task difference to why it could change performance or limit transfer to real witnesses.

Bandura et al. (1961): Aggression

Lesson 1.3.1 | Concepts and methods

1. Psychology and aims

The learning approach emphasises environmental experience and observable behavioural change through classical conditioning, operant conditioning and social learning. Its blank-slate assumption is an approach position, not proof that biology is irrelevant.

Social learning: learning by observing others. A **model** demonstrates behaviour; **imitation** reproduces it. This experiment tested whether aggressive behaviour was copied later in a different setting when the adult model was absent, and examined child/model sex and nonaggressive modelling.

2. Sample and allocation

Seventy-two Stanford nursery children: 36 boys and 36 girls, aged 37-69 months (mean 52 months). Prior aggression and inhibition informed matched triplets; children were then randomly allocated within triplets.

Condition	Children
Aggressive model	24: male/female models; boys/girls
Nonaggressive model	24: same subdivisions
No-model control	24

Laboratory experiment using matched groups. Factors: model behaviour, model sex and child sex (a natural characteristic). Outcomes: frequencies of specified aggressive and nonaggressive responses.

3. Three stages

Exposure, 10 minutes: the child did a separate activity. Aggressive adults sat on, punched, mallet-hit, tossed and kicked Bobo, with aggressive phrases; nonaggressive adults quietly used construction toys.
Frustration: attractive toys were removed after about two minutes, providing common instigation to aggression.
Test, 20 minutes: a fixed array of toys in another room; model absent; behaviour observed through a one-way mirror.

> Novel actions closely matching the model provide stronger evidence of imitation than general rough play with an inflatable doll alone.

Bandura et al. (1961): Aggression

Lesson 1.3.1 | Evidence and interpretation

1. What was measured?

Observers used five-second intervals: 240 units per child. Categories included physical imitation, verbal imitation, partial imitation, nonimitative aggression and nonaggressive behaviour. A second observer scored half the children; agreement coefficients were in the .90s.

2. Mean physical imitation

Children	Aggressive female model	Aggressive male model	No model
Girls	5.5	7.2	1.2
Boys	12.4	25.8	2.0

Nonaggressive-model scores were much lower (0.0-2.5). These are mean scores, not percentages. Boys generally showed greater physical imitation, especially after the male aggressive model.

3. Mean verbal imitation

Children	Aggressive female model	Aggressive male model	No model
Girls	13.7	2.0	0.7
Boys	4.3	12.7	1.7

There was no overall boy/girl difference in verbal imitation. Model-sex patterns depended on the response: same-sex imitation was not a universal rule.

4. Main conclusions

Aggressive-model children reproduced more physical and verbal aggression than nonaggressive and control groups. Conditions did not significantly affect every aggressive response, including gun play or general Bobo punching. Quiet-male-model inhibition was clearer than quiet-female-model inhibition.

> Conclusion: children can learn novel aggressive responses observationally and express them with the model absent. The study tested immediate imitation, not lifelong violence or every form of media influence.

Hint: Specify physical imitation, verbal imitation or another category. Do not treat "aggression" as a single undifferentiated score.

Bandura et al. (1961): Aggression

Lesson 1.3.1 | Evaluation and connections

1. Strengths

Matching and allocation: baseline aggression was considered before assignment, improving group comparison.
Standardisation: exposure time, test-room toy layout and observation intervals supported control and replication.
Defined coding: specific actions and high observer agreement improved measurement consistency.

2. Limitations

Observer awareness: the male model scored all children, knowing the condition when he had been their model; copied actions could also reveal condition.
Artificiality: attacking a doll after an adult demonstration may reflect invited play rather than ordinary interpersonal harm.
Generalisation: one university nursery, short testing and only one model of each sex limit broader conclusions. Model sex was confounded with the two adults' personal features.

3. Child ethics

Children saw aggressive actions/phrases and were deliberately frustrated by toy removal. Immediate imitation shows why exposure and possible later learning require careful welfare evaluation. Young children may find it difficult to resist adult expectations.

Consent, assent, easy withdrawal, distress monitoring and suitable debriefing/remedial care matter. The original paper does not fully describe modern safeguards or establish the absence of lasting effects. Missing detail does not prove that every safeguard was absent.

4. Applications and debates

Application: adults can consider the examples children observe. The study did not directly test long-term violence prevention.
Nature/nurture: behavioural change after exposure supports a learning influence; sex differences do not identify genetic causes.
Individual/situational: prior aggression and child sex were considered alongside modelling conditions.
Children: direct evidence about childhood learning must be weighed against exposure to harm.

> Avoid: "All boys copied men and all girls copied women." The reported patterns were qualified and differed between physical and verbal outcomes.

Hint: Link an ethical criticism to a specific procedure and explain the possible consequence, rather than writing only "the study was unethical".

Fagen et al. (2014): Elephant learning

Lesson 1.3.2 | Concepts and methods

1. Learning concepts

Operant conditioning: consequences change the likelihood of behaviour. **Positive reinforcement** adds a rewarding consequence to increase a response. **Negative reinforcement** removes an aversive event to increase a response; it is not punishment. **Punishment** reduces behaviour.

Primary reinforcer: has unlearned reinforcing value, such as food. **Secondary reinforcer:** gains value through association. **Shaping:** reinforce closer approximations. **Chaining:** link learned actions into a sequence.

2. Aim and sample

Test whether secondary positive reinforcement could train working elephants to cooperate voluntarily with a trunk wash for tuberculosis testing. This was structured observation of learning, not an experiment comparing training methods.

Five selected female elephants in one Nepalese stable: four juveniles aged 5-7, and one adult estimated in her 50s. Staff selected docile, nonpregnant animals without a current calf. They had traditional training histories, but not this reward method.

3. Training procedure

A whistle was paired with chopped banana (a primary reinforcer), becoming a bridge/secondary reinforcer. Trainers captured existing actions, used lures and shaped approximations. Spoken cues were added; small sequences were linked into the full chain.

Tasks: **trunk here** (tip on a palm), **trunk up**, **bucket** (tip inside), **blow** (exhale) and **steady** (hold position). A syringe and fluid were introduced gradually towards 60 mL. Rewards and gradual exposure helped reduce aversion. Progress was tailored to each elephant; mahouts remained nearby without signalling.

4. Measures

Records included session time, number of offers/cues and behavioural performance tests, about every five sessions from session 10. Passing required at least 80% success. Completed full-sequence training ended for that elephant.

> An offer is an opportunity, not necessarily success. The trainer judged response quality; not-yet-taught tasks received 0%, and some components of passed chains received a default 90%.

Fagen et al. (2014): Elephant learning

Lesson 1.3.2 | Evidence and interpretation

1. Completion results

Elephant	Sessions to pass	Mean session minutes
1	30	12.42
2	25	10.29
3	35	13.27
4	35	11.11
5: adult	Did not complete	Not a completion value

Four of five elephants, all juveniles, completed within 35 sessions. Sessions averaged about 12 minutes overall; mean total training time across all five animals was 378 minutes. This is feasibility evidence for this group, not a comparison showing superiority over traditional methods.

2. Recorded learning progress

Mean recorded task success increased from **39.0% after 10 sessions to 89.3% after 35 sessions**. Successful animals had already stopped training, so only Elephants 3 and 4 remained in the session-35 mean. Scores also included defaults. This is not an identical pre/post test of all five.

Task	Mean offers before first pass
Trunk here	295.40
Trunk up	166.20
Bucket	61.40
Blow into bucket	54.25

3. Qualitative observations

For one elephant, replacing saline with water reduced drinking-related problems. The adult did not finish within the available time; calf distraction, a foot abscess and possible physical/vision issues complicate age explanations.

Some elephants completed the practical wash while failing a "steady" test requiring an unnecessary trunk-down position. Assessment criteria can understate functional competence.

Conclusion: reward-based training could establish a useful veterinary sequence in these juveniles. One adult's noncompletion does not show that adult elephants cannot learn.

Fagen et al. (2014): Elephant learning

Lesson 1.3.2 | Evaluation and connections

1. Strengths

Practical relevance: the response served a real veterinary sampling purpose in a working stable.
Detailed repeated records: times, offers and performance tests documented learning rather than only final success.
Adaptation: shaping and gradual exposure allowed training to follow the individual learner's progress.

2. Limitations

No comparison group: superiority or welfare improvement relative to another method was not established.
Measurement: trainer judgements, default scores, some estimated times and changing membership of averages complicate interpretation.
Generalisability: five selected females in one stable, with only one adult, cannot represent all elephants or ages.

3. Animal welfare

The study used positive reinforcement during sessions without adding punishment. Elephants could turn or move away, but existing chains restricted their freedom. Training occurred in familiar stalls without changing normal husbandry; familiar conditions were not necessarily ideal.

Normal management restricted water mainly to grazing periods; water was also offered during training. The study did not impose extra deprivation to make rewards effective. Existing care, discomfort and the adult's health still require evaluation.

Evaluate replacement, species, justified numbers, housing, rewards/deprivation and pain/distress. Potential veterinary benefit is not the same as a directly measured improvement in welfare.

4. Applications and debates

Application: reward-based cooperation with husbandry and veterinary procedures.
Nurture: shaping/chaining illustrates learned behaviour, interacting with health, age and prior experience.
Individual/situational: differences between learners and training conditions were not separately isolated.
Animals: research can benefit the animals themselves, while still needing welfare safeguards.

> Remember: reinforcement increases behaviour; punishment decreases it. Positive/negative describe adding/removing consequences, not good/bad treatment.

Hint: State who remains in an average and how the score was assigned before describing a change as learning.

Saavedra and Silverman (2002): Button phobia

Lesson 1.3.3 | Concepts and methods

1. Psychology and background

Specific phobia: persistent fear/avoidance of a particular object or situation, interfering with life. **Fear** concerns perceived threat; **disgust** is revulsion. Both can contribute to avoidance.

Classical conditioning: associations change the response to a stimulus. **Expectancy learning:** the object signals a feared negative outcome. **Evaluative learning:** the object itself becomes negatively evaluated, without requiring an expectation of objective danger.

Operant links: escaping buttons can remove distress and negatively reinforce avoidance. Rewarding contact can positively reinforce approach. Improved approach does not automatically mean disgust has disappeared.

2. Aim and case

Examine the role of disgust and evaluative learning in one child's button phobia and treatment. Longitudinal clinical case study of a nine-year-old Hispanic American boy referred with his mother to a university child-anxiety programme in Miami.

Avoidance had lasted about four years. At age five, a bowl of buttons reportedly spilled over him during a school art task. He later avoided buttoned clothing and contact, affecting uniform use and concentration. This retrospective history suggests a possible learning event, not a demonstrated cause.

3. Assessment and first treatment phase

Child/parent anxiety interviews, observed approach, a ranked distress hierarchy and the **Feelings Thermometer (0-8)** supplied different data. Sessions included about 30 minutes with the child and 20 with the child/mother.

Gradual real-life exposure progressed from easier to harder button tasks; his mother reinforced successful completion. After early behavioural improvement, persistent disgust prompted further imagery and cognitive work.

> A case study is an in-depth investigation of one participant. It is not a controlled experiment with a randomly assigned treatment and control group.

Saavedra and Silverman (2002): Button phobia

Lesson 1.3.3 | Evidence and interpretation

1. Initial distress hierarchy

Example stimulus/task	Distress / 8
Large denim-jean buttons	2
Large coloured plastic buttons	4
Hugging mother wearing large plastic buttons	5
Medium clear plastic buttons	6
Small clear plastic buttons	8

2. Approach improved before distress did

By session four, all tasks in the hierarchy had been completed. However, ratings rose between sessions two and four, sometimes exceeding initial distress. The child could approach buttons while still evaluating them negatively.

Further questioning revealed revulsion and unpleasant smell associations. The next seven sessions incorporated progressively harder imagery, such as buttons falling on him, alongside cognitive strategies targeting negative evaluations.

3. Imagery ratings

Imagined event	Before	Midway	After
Hundreds of buttons falling on his body	8	5	3
Hugging mother in a shirt full of buttons	7	4	3

These are one child's ratings during two exposures, not group means or separate experimental conditions.

4. Outcome and conclusion

After treatment, distress was minimal and the boy no longer met the study's DSM-IV specific-phobia criteria. He wore his school shirt with clear plastic buttons daily. Gains were maintained at six- and twelve-month follow-ups.

Conclusion: disgust was important in this case. Disgust-focused work accompanied improvement, but the combined, sequential treatment does not isolate one effective mechanism.

Saavedra and Silverman (2002): Button phobia

Lesson 1.3.3 | Evaluation and connections

1. Strengths

Depth: interviews and a detailed history illuminated an unusual phobia.
Multiple measures: observation and subjective ratings revealed that approach and distress did not initially improve together.
Longitudinal follow-up: six-/twelve-month assessments checked maintenance beyond immediate treatment.

2. Limitations

One selected case: age, background and unusual symptoms restrict generalisation.
No control: time, expectations, family involvement and earlier exposure could also affect later change.
Combined treatment: reinforcement, in-vivo exposure, imagery and cognitive work were not independently compared.
Retrospective history: remembering the onset years later may involve reconstruction.

3. Child ethics

The boy and mother gave informed consent for assessment/treatment. The mother later provided written permission for the report and publication after follow-up. The child was not named; detailed clinical information still required confidentiality.

Exposure deliberately brings contact with distressing stimuli. Initial increases in ratings show why visible compliance cannot be the only welfare measure. Monitor distress, maintain assent/withdrawal and adapt treatment carefully. A positive eventual outcome does not erase the need to assess burdens.

4. Applications and debates

Application: assess emotional experience as well as observed avoidance; disgust may matter even when approach improves.
Nature/nurture: the learning account and changing responses support experience-related influences, without excluding biological predispositions.
Individual/situational: treatment was adapted to one child's responses and family context.
Children: direct clinical research can inform age-appropriate help, but consent and privacy need special care.

> Remember: reduced avoidance, reduced disgust and absence of a diagnosis are different outcomes. Do not use them interchangeably.

Hint: Separate evidence about how a phobia began from evidence about what happened during treatment. Neither automatically identifies a single cause.

Milgram (1963): Obedience

Lesson 1.4.1 | Concepts and methods

1. Psychology and aim

The social approach explains behaviour, thoughts and emotions through social contexts and the actual, implied or imagined presence of others. **Obedience** is following instructions from a perceived authority. **Social pressure** can create conflict between instructions and personal conscience.

The study investigated how far people would obey commands to administer apparently harmful shocks. It challenged predictions that destructive obedience would be confined to very few people.

2. Sample and laboratory situation

Forty men aged 20-50 from New Haven and nearby communities volunteered through newspaper adverts/direct mail. Occupations and education varied. They received $4.50 simply for attending and could retain it regardless of what happened.

At Yale, a stern experimenter in a grey technician's coat presented a memory-and-learning cover story. A friendly learner was an accomplice. A rigged draw ensured the real participant became the teacher; the learner was strapped into a chair with electrodes.

3. Task and apparatus

The teacher read word pairs and tested matching words. Preset learner errors required increasing shock levels: 30 switches, 15-450 V in 15 V increments, with escalating danger labels. The participant received a real 45 V sample shock; the learner received no actual shocks.

This exact condition had no learner voice feedback. The learner pounded on the wall at 300 V and again at 315 V, then was silent. Missing answers were counted as errors and the teacher was instructed to continue.

4. Method

Controlled laboratory procedure with observation and interviews. The main study had **no manipulated IV or comparison condition**. Maximum shock delivered was the measure of obedience; visible tension and interview responses added evidence.

> Do not import spoken pain protests from other Milgram variations into this core study. The specified main condition used wall pounding and silence.

Milgram (1963): Obedience

Lesson 1.4.1 | Evidence and interpretation

1. Prods and stopping

Standard prods progressed from a request to continue, to the experiment's requirement, absolute necessity and finally a statement denying choice. Special responses addressed concerns about permanent tissue damage. Persistent refusal ended the procedure.

2. Quantitative results

Outcome	Result
Reached at least 300 V	40 / 40
Reached 450 V: fully obedient	26 / 40 = 65%
Refused before 450 V	14 / 40 = 35%

Maximum settings among the 14 refusers: 300 V (5 men), 315 V (4), 330 V (2), 345 V (1), 360 V (1), 375 V (1).

Fourteen psychology students had predicted, on average, that only 1.2% would reach the top level. Participants rated the final shocks as very painful: mean 13.42 on a 14-point scale; mode 14.

3. Emotional observations

Sweating, trembling, stuttering, groaning and lip-biting showed strain. Fourteen displayed nervous laughter/smiling; three severe uncontrollable episodes were described. Some participants remained relatively calm. Continuing did not necessarily mean approving of, or enjoying, harm.

4. Interpretation

Yale's legitimacy, the scientific role, commitment and reassurance may help explain obedience. These influences were not separately manipulated in the original condition. Fourteen refusals and varied distress also show individual variation.

Conclusion: authority pressure could produce unexpectedly high destructive obedience and substantial conflict. The findings do not imply that all people always obey authority.

Milgram (1963): Obedience

Lesson 1.4.1 | Evaluation and connections

1. Strengths

Control: preset learner responses and ordered prods supported a consistent procedure.
Operationalisation: maximum shock level defined obedience clearly and quantitatively.
Multiple data: behaviour, tension observations and interviews helped interpret the psychological conflict.

2. Limitations

Sample: 40 male volunteers from one US area do not represent every sex, culture or setting.
Artificial task: laboratory switches and a research cover story differ from many real authority situations; expectations could affect behaviour.
No isolated causes: the original study did not separately test Yale, payment, the coat or personality. Do not present these explanations as experimentally demonstrated causes here.

3. Ethics

Deception/consent: the real purpose, rigged allocation, learner and shocks were concealed or misrepresented.
Harm: believing one was harming another person caused marked distress even though the learner was safe.
Withdrawal: repeated prods, especially denial of choice, could undermine freedom to stop.

The report describes interviews, reassurance and reconciliation with the learner. These efforts matter, but debriefing does not automatically undo distress or fully restore prior informed choice.

4. Debates and application

Situational: a legitimate-seeming authority context accompanied high obedience. **Individual:** some refused and emotional responses differed; the causes of these differences were not isolated.
Application: findings can inform discussion of questioning harmful orders and routes to raise concerns. Training effectiveness was not tested.
Nature/nurture: the study did not separate inheritance from lifelong experience.

> Common mistake: calling this main condition a two-group experiment with an IV. The official core study specifies no IV in the main condition.

Hint: A situational explanation needs a specific social feature and a link to behaviour, while acknowledging whether that feature was actually manipulated.

Perry et al. (2015): Personal space

Lesson 1.4.2 | Concepts and methods

1. Psychology and aim

Personal space/interpersonal distance: preferred spacing between people. **Empathy:** responses to others' experiences. **Oxytocin (OT)** is a hormone involved in social processes. The social-salience account proposes enhanced processing/importance of social cues, not universal friendliness.

Test whether OT affects preferred interpersonal distance differently for people with higher versus lower empathy. Predictions: closer distances with OT for higher empathy, greater distances for lower empathy.

2. Participants and design

Initially 54 male Haifa undergraduates, aged 19-32 (mean 25.29), received course credit/payment. Extreme IRI scores defined analysed empathy groups: **20 higher (at least 40), 20 lower (at most 33)**. Empathy was measured, not manipulated.

Mixed design: treatment within participants; empathy between groups. Participants attended twice, one week apart, at the same day/time, receiving 24 IU intranasal OT or saline placebo. Double blindness reduced expectations; task order was counterbalanced. A 45-minute wait preceded tasks.

3. Measures and tasks

The Interpersonal Reactivity Index (IRI) has 28 items across perspective-taking, empathic concern, personal distress and fantasy. It was completed online at the first appointment after administration.

Experiment 1: animated Comfortable Interpersonal Distance task. A friend, stranger, authority figure or ball approached along one of eight routes. Pressing the spacebar stopped approach at a comfortable point.

Experiment 2: choose between room pictures for an expected later personal conversation. Pairs varied chair distance/angle or table-plant distance/angle; 168 presentations. No actual conversation followed.

> CID scores are percentages of the route remaining: larger means farther away. Room-choice chair distances are centimetres. Do not mix the two units.

Perry et al. (2015): Personal space

Lesson 1.4.2 | Evidence and interpretation

1. CID: stimulus mattered

Approaching stimulus	Mean route remaining (%)
Stranger	39.82
Authority	34.12
Ball	20.20
Friend	12.46

These means combine groups/treatments. Stranger distances were greatest; friend/ball did not differ reliably as a pair.

2. CID: treatment and empathy

Group	Placebo (%)	OT (%)
Higher empathy	26.11	23.29
Lower empathy	26.98	30.20

The means moved in predicted opposite directions, but the simple empathy-by-treatment interaction was not conventionally significant. A supported more complex interaction also involved stimulus type. Separate overall group drug effects were not significant.

3. Room choice: preferred chair distance

Group	Placebo (cm)	OT (cm)
Higher empathy	80.58	78.07
Lower empathy	78.33	80.14

One higher-empathy participant had technical problems, so Experiment 2 analysed **39 people**. The chair-distance interaction was supported; table-plant preferences did not show it. Neither empathy group alone showed a conventionally significant treatment difference.

Chair distances ranged 20-140 cm in 20 cm steps; table-plant distances 200-320 cm. Angles were 0°, 45° or 90°. Placebo task scores correlated modestly: r = +.278.

Conclusion: OT-related preferences depended on empathy and the social task/stimulus. Do not simplify to "OT significantly made every high-empathy person closer" or "OT makes everyone sociable".

Perry et al. (2015): Personal space

Lesson 1.4.2 | Evaluation and connections

1. Strengths

Placebo and double blindness: reduced treatment expectations and experimenter cues.
Within-person treatment comparison: each participant served as his own comparison, reducing stable individual differences.
Task controls: standardised stimuli, counterbalanced task order and a non-interpersonal furniture condition improved interpretation.

2. Limitations

Restricted sample: male undergraduates and extreme IRI groups limit transfer to other people or the middle of the empathy range.
Indirect behaviour: computer figures and pictured chairs do not reproduce live encounters fully.
Complex evidence: modest samples and uncertain simple effects require careful interpretation. Significant interactions are not the same as significant separate drug effects in each group.

3. Ethics

Written consent, screening and institutional approvals were reported. No significant physical, local or systemic side effects were observed. Participants expected a later personal conversation that did not occur, involving deception; the study's purpose was explained after both visits.

Biological administration requires screening and monitoring. Questionnaire and personal-preference data require confidentiality. An absence of reported side effects does not replace these safeguards.

4. Debates and application

Person and situation: measured empathy, changed treatment and social stimulus jointly matter. This is a clear interaction example.
Nature/nurture: a biological treatment is not a test of genetic inheritance; the origins of empathy were not established.
Application: consider individual/context differences in social-space research. The study did not test a treatment or establish one ideal seating distance.

> Remember the sample sequence: 54 recruited; 40 in extreme-empathy comparisons; 39 in the room-choice analysis. Keep the denominators attached to the result.

Hint: An interaction means the relationship between one factor and the outcome depends on another factor. State the factors and the evidence, not just the word "interaction".

Piliavin et al. (1969): Subway Samaritans

Lesson 1.4.3 | Concepts and methods

1. Psychology and aims

Bystander apathy: failing to help someone in need. **Diffusion of responsibility:** each witness may feel less personal responsibility when others could act. A visible emergency with limited escape may differ from earlier laboratory emergencies that were only heard.

Investigate effects of victim condition/race, a helping model and observed group size on helping frequency and speed in a real setting.

2. Participants and setting

About 4,450 unsolicited New York subway passengers across 103 staged collapses, weekdays 11 a.m.-3 p.m., April-June 1968. Express journeys between 59th and 125th Streets lasted about 7.5 minutes. Cars averaged 43 passengers, about 8.5 in the critical area.

Four student teams each had a male victim, male model and two unobtrusive female observers. Victims were three White men and one Black man, aged 26-35; White models were 24-29.

3. Field experiment and procedure

Victim condition: apparently ill with a cane (65 trials), or smelling of alcohol with a bottle in a paper bag (38 trials). Race varied with actor; group size was observed, not set. DVs included help, latency, helper characteristics, movement and comments.

About 70 seconds after departure, the victim collapsed and remained on his back until helped. Clothing/position/collapse were kept similar. Models could help from the critical/adjacent area, early (about 70 seconds) or late (about 150 seconds after collapse), or have no scheduled intervention.

Observers recorded passengers, first response time, helpers, movement and remarks. If still needed, the model assisted before the next stop. Conditions were unequal and not perfectly alternated; a strike interrupted the study.

A trial receiving help, the number of helpers, spontaneous help and further help after a model are different measures.

Piliavin et al. (1969): Subway Samaritans

Lesson 1.4.3 | Evidence and interpretation

1. Spontaneous help before the model acted

Victim condition	Trials with help	Proportion
Cane	62 / 65	About 95%
Drunk	19 / 38	50%

Median response latency on **non-model trials**: cane 5 seconds; drunk 109 seconds. Nonresponses were coded as 400 seconds. These medians do not describe every model condition.

2. Helpers and modelling

About 90% of spontaneous first helpers were men, compared with about 60% of critical-area passengers. More than one person helped on about 60% of the 81 spontaneous-help trials. Same-race helping was more apparent with drunk victims, but that specific trend was not significant.

In the small drunk-condition model comparison, further help followed 9/9 early interventions versus 3/7 late interventions. Model location showed no reliable effect; few cane model trials were available.

3. Other responses and group size

Thirty-four passengers left the critical area across 21 trials. Moving away and comments were more common with delay and in drunk trials. Remarks concerned discomfort, uncertainty or perceived ability to lift the victim.

The expected slowing of help with larger groups did not appear here. Visible need and restricted escape may matter. Group size was not experimentally allocated; the finding does not disprove diffusion in all situations.

4. Arousal and cost-reward explanation

An emergency may create unpleasant arousal. Helping, obtaining help, moving away or reinterpreting the victim may reduce it. Helping can cost effort, embarrassment or risk but bring approval; not helping can preserve one's activity but bring guilt or criticism.

Conclusion: victim cues and context related to helping. The cost-reward account is a proposed explanation, not a set of mechanisms separately demonstrated by this experiment.

Piliavin et al. (1969): Subway Samaritans

Lesson 1.4.3 | Evaluation and connections

1. Strengths

Ecological validity: passengers encountered an apparently genuine emergency during ordinary travel.
Repeated trials: comparable staged collapses supported condition comparisons.
Mixed evidence: counts/times were complemented by movement and comments, enriching interpretation.

2. Limitations

Confounds: one Black versus three White victims confounded race with actor identity. Unequal cane/drunk trials and imperfect alternation weakened balance.
Uncontrolled groups: passenger composition varied; some could have appeared on more than one trial. Observed group size does not establish its causal effect.
Generalisation: a daytime New York express train with limited exit differs from an open street, remote emergency or other culture/time.

3. Ethics

Passengers did not give prior informed consent and were deceived into seeing a staged collapse. They might feel distress or attempt physical assistance. The moving train restricted withdrawal; the report does not describe full passenger debriefing.

Realistic field evidence has value, but realism does not cancel the obligation to assess welfare, consent, privacy and exit options. Public observation and a staged emergency pose different ethical burdens.

4. Debates and applications

Individual/situational: helper characteristics may matter alongside victim cues, model behaviour and the train setting. A victim's appearance is part of the helper's social situation.
Application: findings can inform discussion of visible need and perceived costs, but do not establish how every emergency should be handled.
Nature/nurture: more male first helpers does not establish an innate sex difference in helpfulness.

> Common error: "62 people helped cane victims." The 62 counts cane trials receiving spontaneous help; there could be multiple helpers in a trial.

Hint: Attach each statistic to its condition, time window and unit: trials, people, seconds or proportions.

Application of psychology to everyday life

Lesson 1.5.1 | Concepts and methods

1. What is an application?

An application uses psychological knowledge to inform a practical decision, intervention or design. It needs a clear connection between a finding, a proposed action and an intended benefit. A plausible suggestion is not the same as an intervention demonstrated to work.

Hint: Use finding → who changes what → intended benefit → evidence needed to check that benefit.

2. From evidence to a usable proposal

Finding: identify the actual behaviour measured, participants and conditions.
Mechanism: explain why the finding makes the proposed action plausible, distinguishing a tested process from speculation.
Action: say who would do what, rather than simply stating that the study is useful.
Outcome: define the practical improvement, such as retained information or safer animal cooperation.

3. Three important distinctions

Research instrument versus treatment: the Eyes Test measures a component of social cognition; this study did not test therapy.
Biological measurement versus functional benefit: brain structural change after MBSR does not establish better memory.
Possible use versus tested use: Milgram can inform authority training, but did not test whether training prevents harmful obedience.

4. Applications differ in closeness to the evidence

Fagen trained the veterinary sequence itself, providing direct feasibility evidence for that activity. Saavedra and Silverman followed an actual treatment, but only in one child. A recommendation about classroom doodling extends beyond Andrade's short adult listening task.

The stronger the change in target population, setting, task or outcome, the more evidence transfer requires. A controlled experiment may have strong internal validity yet still offer limited evidence about an everyday intervention.

5. Avoid stereotypes

Group averages do not prescribe what every individual needs. Monkey toy preferences cannot determine a child's toys; personal-space means cannot establish an ideal distance for every person. Applications should respect individual variation and avoid unfair labelling.

Application of psychology to everyday life

Lesson 1.5.1 | Evidence and interpretation

1. Biological and cognitive applications

Study	Possible use and boundary
Dement and Kleitman	Objective sleep/dream-recall investigation; not proof of a universal sleep treatment.
Hassett	Investigate activity preferences and socialisation; not rules about children's toys.
Hölzel	Study training-related plasticity; clinical and functional benefits need separate tests.
Andrade	Try low-demand activity during dull listening; not all drawing or multitasking.
Baron-Cohen	Research social sensitivity; not stand-alone diagnosis or complete empathy assessment.
Pozzulo	Make line-up rejection clear and acceptable; real police procedures need direct evaluation.

2. Learning and social applications

Study	Possible use and boundary
Bandura	Consider models children observe; no direct proof of lasting violence prevention.
Fagen	Reward-based veterinary cooperation; no comparison proving superior welfare.
Saavedra and Silverman	Assess disgust as well as avoidance; one combined-treatment case limits generalisation.
Milgram	Discuss harmful authority pressure and speaking up; workplace training was not tested.
Perry	Consider individual/context differences in spacing; no universal OT or seating prescription.
Piliavin	Consider visible need and perceived costs; no universal crowd or emergency rule.

Each proposal must remain attached to its evidence. For example, Andrade's combined adjusted recall was 7.5 versus 5.8; the tested activity was shading supplied shapes during a monotonous message, not unrestricted drawing in a complex lesson.

Application of psychology to everyday life

Lesson 1.5.1 | Evaluation and connections

1. Evaluating validity and generalisation

Construct validity: does the outcome measure the intended real-life benefit? Liking an activity is not evidence of better retention.
Population: do adults, children, clinical cases or selected animals match the proposed users?
Task and setting: does a laboratory response resemble the everyday problem?
Time: was the outcome immediate or maintained over months?

2. Evaluating feasibility and ethics

Consider time, training, resources and accessibility. A useful intervention may be impractical at scale or benefit only some users. Weigh likely benefits against distraction, distress, privacy costs or unfair treatment. Biological or diagnostic findings require careful, respectful interpretation.

Animal-care applications need welfare checks as well as successful task completion. Rewards do not automatically resolve housing, restricted movement or health concerns. A human application must protect voluntary choice and confidential data.

3. How to test a proposed application

Define the target population and a relevant outcome. Compare the proposed approach with normal practice or a suitable alternative; use allocation and controls where possible. Measure benefits, unintended effects and persistence, rather than relying only on impressions.

For a doodling proposal, compare clearly defined listening activities, measure later retained information and check distraction. Extending to children requires age-appropriate procedures and consent/assent, rather than assuming an adult result transfers unchanged.

4. Writing an application answer

A developed answer links a named study detail to a realistic action and explains why it might help. If evaluation is required, identify a specific difference between research and proposed use and explain its consequence.

> Hint: Replace "this improves education" with a precise user, action and outcome. Then identify what the study did and did not demonstrate.

Example reasoning: stronger recall during simple shading makes a low-demand listening aid plausible. However, complex drawing could compete for attention, so the result cannot justify all classroom multitasking.

Individual and situational explanations

Lesson 1.5.2 | Concepts and methods

1. Individual explanations

An individual explanation focuses on the person: abilities, personality, biological characteristics, beliefs or prior experiences. It can explain why people differ in the same broad setting. Individual does not mean inherited, permanent or impossible to change.

Examples include empathy scores in Perry, prior aggression in Bandura and one child's button-related disgust. Learned experiences can become individual characteristics.

2. Situational explanations

A situational explanation focuses on circumstances: social roles, other people, instructions, rewards, available choices and task conditions. It can explain why one person behaves differently across contexts. A situation includes implied authority or an expected conversation, not only a physical place.

Individual focus	Situational focus
Empathy or beliefs	Who approaches; social relationship
Age, ability, prior experience	Instructions, task demands, cues
Baseline aggression	Adult modelling condition
A learned fear	Current exposure and rewards

3. Not the same as nature versus nurture

Nature/nurture asks about innate/inherited influences and environmental experience. Individual/situational asks where an explanation focuses. A learned fear is individual but experience-related. An administered hormone is biological yet part of a changed current condition.

4. Whose behaviour is being explained?

For the subway helper, the victim's cane or apparent drunkenness is a cue in the helper's social situation. The helper's own perceived lifting ability is an individual factor. Naming the person whose behaviour is explained prevents inconsistent classification.

Hint: Identify the behaviour, the person and the proposed influence before labelling an explanation individual or situational.

Individual and situational explanations

Lesson 1.5.2 | Evidence and interpretation

1. Social studies

Study	Evidence and interpretation
Milgram	26/40 reached 450 V in an authority setting; 14 refused. The setting mattered, but neither personality nor individual authority cues were isolated.
Piliavin	62/65 cane trials versus 19/38 drunk trials received spontaneous help. Victim cues and the train context matter; helper differences and varying passengers also matter.
Perry	Measured empathy combined with OT/placebo and task/stimulus differences. Conditional results support considering person and situation together.

2. Cognitive and learning studies

Study	Individual and situational factors
Andrade	Individual attention may vary; shading and a monotonous message changed task circumstances.
Baron-Cohen	Natural diagnostic/cognitive differences; static eyes and supplied words shaped performance.
Pozzulo	Age-related cognition; target type, presence and adult-led expectations.
Bandura	Prior aggression and child sex; changed adult modelling conditions.
Fagen	Age, health and history; reinforcement, cues and distractions.
Saavedra and Silverman	One child's responses; changed exposure and family reinforcement.

3. Biological examples

Dement and Kleitman examined sleep physiology with individual rhythm/recall differences in a controlled laboratory. Hassett combined sex/preferences with group access and rank. Hölzel combined motivated self-selection with an experience-based course. Biological research is not automatically a personality explanation.

Individual and situational explanations

Lesson 1.5.2 | Evaluation and connections

1. Strengths of individual explanations

They account for different responses within similar settings and can guide personalised support. Perry illustrates why an average treatment account may hide different directions of response. Saavedra and Silverman show the value of assessing the specific person's feelings rather than only visible behaviour.

2. Risks of individual explanations alone

They can overlook authority pressure, task demands or unequal opportunities. Calling obedient participants simply "bad people" ignores Milgram's social setting and distress. Group differences also do not establish the cause of individual differences.

3. Strengths and risks of situational explanations

Situational accounts identify conditions that could potentially be changed, such as modelling or instructions. Controlled changes can support causal interpretation when design and measures are sound. However, a situation-only account may overlook variation in abilities, beliefs or prior experience.

Milgram's original condition did not separately manipulate Yale, clothing or payment. Piliavin's group size was observed. A named situational feature is not automatically an experimentally established cause.

4. Interaction

An interaction means a factor's relationship with behaviour depends on another factor. In Perry, treatment-related distance patterns depended on empathy and the task/stimulus. An interaction account must show how the combination matters; merely listing person and environment is insufficient.

5. Build a balanced explanation

Identify a study-specific result; link it to the proposed factor; distinguish manipulated conditions from natural group differences or correlations. Then explain what remains unresolved. Do not claim that one study has removed every competing explanation.

> Hint: Use "the result supports..." with a concrete link. Avoid "proves personality" or "proves the situation" when the proposed cause was not isolated.

Useful judgement: both person and context can matter, but their relative contributions require evidence. A balanced answer is precise about what was measured, changed and left uncontrolled.

Nature versus nurture

Lesson 1.5.3 | Concepts and methods

1. Nature

Nature refers to innate or inherited influences, including genetic contributions and biological predispositions. Brain systems and hormones may express such influences. However, observing a biological difference is not automatically evidence of inheritance: experience can affect biological systems too.

2. Nurture

Nurture refers to environmental experience, including socialisation, education, models, reinforcement, associations and life events. Learning can change behaviour and may also be associated with brain change. Nurture is not limited to deliberate teaching.

Nature emphasis	Nurture emphasis
What inherited predisposition may contribute?	What experience or learning may contribute?
What biological constraints or biases may matter?	What consequences, models or opportunities may matter?
What evidence separates inheritance from experience?	What changed following environmental experience?

3. Interaction

Biological characteristics can influence what captures attention or is rewarding; experience then changes opportunities, behaviour and development. Experience can also alter biological structure. Nature and nurture need not be competing complete explanations.

Hassett proposed biologically influenced preferences sculpted by social experience. Hölzel linked an experience-based programme to structural change. Together, these examples challenge a simple opposition between biology and learning.

4. Keep the debates distinct

An individual characteristic may be learned, while a current situational manipulation can involve a biological substance. Nature/nurture concerns origins and development; individual/situational concerns the focus of an explanation.

Hint: Ask whether a study measured physiology, compared natural groups, manipulated experience or directly investigated inheritance. These are different forms of evidence.

Nature versus nurture

Lesson 1.5.3 | Evidence and interpretation

1. Biological studies

Hassett: male monkeys preferred wheeled toys without explicit human gendered toy teaching, suggesting a possible biological predisposition. Prenatal hormones were not manipulated here; monkey social experience, rank and access remained relevant.

Hölzel: eight weeks of MBSR were associated with changes in regional gray-matter concentration. This supports experience-related plasticity, but self-selection, inactive control and multiple programme components limit causal claims. It did not quantify genetic contribution.

Dement and Kleitman: sleep physiology was linked with dream recall. This supports a biological account of sleep but did not compare inherited influences with learning histories.

2. Learning studies

Study	Evidence relevant to nurture	What remains unresolved
Bandura	Different modelling exposure changed later imitation.	Origins of every child/sex difference; long-term effects.
Fagen	Rewards, shaping and chaining established a new sequence.	Inherited capacity and other factors; no control method.
Saavedra and Silverman	Responses changed during exposure and later imagery/cognitive work.	Initial cause and the effective treatment component.

3. Other studies

Perry manipulated a hormone, not genes; biological treatment is not genetic proof. Baron-Cohen's group differences did not establish inherited causes. Pozzulo's age differences may combine maturation and experience. Andrade changed a task, not genetic attention differences.

Milgram and Piliavin highlight social environments associated with behaviour, but did not partition inherited characteristics and lifelong experience. Use them for qualified social influences rather than an exclusive nurture verdict.

Nature versus nurture

Lesson 1.5.3 | Evaluation and connections

1. Evaluating a nature emphasis

Contribution: draws attention to biological predispositions, variation and constraints that a purely social account might miss.
Risk: treating a biological association as fixed or genetic can overlook learning, context and change. Sex differences alone cannot identify a hormonal or inherited cause.

2. Evaluating a nurture emphasis

Contribution: identifies experiences and conditions that might be changed, including models and reinforcement.
Risk: learning evidence does not establish that all biology is irrelevant. Small samples, no comparison group or combined treatments can make the source of change uncertain.

3. Evaluating interaction

Interaction can explain why the same experience affects learners differently and why experience leaves biological traces. It is more informative than a forced either/or judgement, but needs evidence about how influences combine. Simply saying "both matter" does not explain a result.

4. Common reasoning errors

"Brain measure = nature": Hölzel measured change after experience.
"Hormone administration = inheritance": Perry did not manipulate genes.
"Sex difference = innate": social histories and other characteristics can differ.
"Age difference = maturation only": experience and testing circumstances also change.
"Treatment worked = original cause known": reducing symptoms does not identify how they began.

5. Writing with evidence

Define and label nature and nurture explicitly. Choose a precise result that supports the relevant influence, then state the methodological boundary. A manipulated experience, natural group comparison and correlation permit different strengths of conclusion.

> Hint: Use the sequence: define the side → identify a study detail → explain the link → qualify what the design cannot establish.

Example: imitation after changed model exposure supports environmental learning. It does not show that all aggression is learned, nor explain the origins of every child difference.

Use of children in psychological research

Lesson 1.5.4 | Concepts and methods

1. Why study children directly?

Child research can investigate development when it occurs, compare ages, improve understanding of learning and eyewitness decisions, and address distress affecting daily life. Adults' memories or animal findings cannot substitute for every question about children's current behaviour.

Core study	Child participants	Main value
Bandura	72; 37-69 months	Imitation after adult modelling.
Pozzulo	59; ages 4-7	Child/adult line-up comparison.
Saavedra and Silverman	One nine-year-old boy	Detailed clinical assessment and follow-up.

2. Comprehension and measurement

Language, attention and developmental understanding affect responses. Instructions, questions and rating scales must suit the child. A wrong answer may reflect misunderstanding rather than poor memory or the intended psychological process.

Pozzulo used familiar cartoons, clear instructions and a demonstrated silhouette. Saavedra used a simple distress scale alongside observations. Multiple measures can reveal differences that visible compliance alone hides.

3. Social pressure

Children may try to please adults, assume a correct answer must be supplied or comply with authority. Task demands can therefore affect validity as well as ethics. Pozzulo's absent-line-up errors were consistent with social influences, but pressure was not separately manipulated.

4. Developmental variation

Children are not one uniform group. A four-year-old and a teenager differ in language, experience and understanding. Age differences do not isolate maturation from learning. A single nursery, private-school sample or clinical case restricts wider generalisation.

A child-friendly task may protect welfare and improve understanding, while reducing similarity to stressful real-world events. Evaluate both effects.

Use of children in psychological research

Lesson 1.5.4 | Evidence and interpretation

1. Human ethical principles applied to children

Guideline	What it requires in practice
Minimise harm; maximise benefit	Consider fear, frustration, shame and possible later learning, not only physical injury. Monitor and adapt/stop.
Valid informed consent	Suitable parent/guardian permission and information the child can understand; check willing assent.
Right to withdraw	Make stopping clear and practical; notice reluctance, not only a formal verbal request.
Avoid deception	Do not assume a child can evaluate misleading purposes or hidden expectations.
Privacy	Avoid unnecessary intrusion into personal experiences or observations.
Confidentiality	Protect identifiable responses, clinical details and recordings.
Debriefing	Explain in suitable language, correct misunderstandings and check welfare.

2. Consent is an ongoing process

A parent's signature does not remove the child's right to disagree or stop. Silence, compliance or accepting a reward does not establish freely given assent. School authority, praise or incentives should not make refusal feel unsafe.

3. Scientific and ethical quality overlap

Distress or pressure can alter behaviour and weaken measurement. Comfortable participation and understandable tasks can improve evidence. However, welfare safeguards are needed even when researchers think the data would be useful.

Hint: Separate a documented safeguard, a potential risk and an unreported detail. Missing reporting does not prove that every safeguard was absent.

Use of children in psychological research

Lesson 1.5.4 | Evaluation and connections

1. Bandura: knowledge and concern

Direct child participation showed novel imitation after modelling. Children also observed aggression and experienced deliberate frustration. Possible learning beyond the session and later welfare require attention; the original report does not establish that lasting effects were absent.

Modern consent, assent, withdrawal and remedial/debriefing arrangements are not fully detailed. Do not invent a reported procedure to remove learned aggression.

2. Pozzulo: documented safeguards

Parents gave written consent. Children were told they could change their minds without trouble. Craft activities built rapport; fatigue, anxiety and stress were monitored. Everyday clips avoided a real traumatic crime; small gifts followed participation.

This supported comfort and task understanding. The same benign clips and short delay limit transfer to stressful eyewitness events, while cartoons/humans differed in more than familiarity.

3. Saavedra and Silverman: benefit and burden

The boy and mother consented to assessment/treatment; the mother later gave written publication permission. Distress declined and gains persisted at six/twelve months. Nevertheless, initial ratings rose despite improved approach, showing why the child's emotional report mattered.

Exposure required careful monitoring, and detailed clinical publication required confidentiality. One case cannot establish the same outcome for every child.

4. Balanced judgement

Study children when their participation is necessary for a worthwhile question with suitable protection. Weigh the specific knowledge gained, method suitability, welfare burden, reported safeguards and remaining uncertainty. Do not conclude simply that children should always or never be studied.

> Hassett tested monkeys, not children. Adult or animal comparisons can inform hypotheses, but cannot directly establish an individual child's preference, cognition or welfare.

Hint: Develop a point using research value or risk → exact study detail → consequence for understanding, validity or child welfare.

Use of animals in psychological research

Lesson 1.5.5 | Concepts and methods

1. Why use animals?

Animal behaviour is worth understanding in its own right. Comparative research can investigate whether a pattern requires a specifically human experience. Applied research can improve husbandry and veterinary cooperation. The question must justify the species and method.

Study	Animals	Purpose
Hassett	34 analysed rhesus monkeys: 11 males, 23 females	Wheeled/plush toy preferences.
Fagen	Five female elephants: four juveniles, one adult	Reward-based trunk-wash training.

2. Scientific advantages

Different environmental histories allow some questions to be examined without explicit human teaching. Video and behavioural definitions support direct measurement. Repeated exposure or training can document behaviour across time.

Hassett offered both toy types in a familiar group enclosure. Fagen recorded offers, times and performance while training a useful sequence. These methods addressed different questions: comparative preferences versus practical learning.

3. Scientific limitations

Species differences: similar actions may have different meaning or causes in different species.
Internal experience: animals cannot give the same verbal explanation or rating as humans.
Anthropomorphism: assigning human motives or gender meanings to animal actions can mislead.
Sampling/control: a captive troop or five selected animals may not represent other populations.

4. Generalisation needs evidence

Hassett's findings do not prove that human toy preferences are genetically fixed. Fagen's adult noncompletion does not prove that older elephants cannot learn. Evaluate what the sample and task actually establish before extending to another species or age.

> Behavioural cooperation or approach is not human informed consent. Some ability to avoid a task can still matter for welfare, with its practical limits stated.

Use of animals in psychological research

Lesson 1.5.5 | Evidence and interpretation

1. Official animal ethical guidelines

Guideline	Questions to ask
Minimise harm; maximise benefit	Does expected knowledge or practical benefit justify physical and psychological welfare costs?
Replacement	Could existing records, models or another method answer without live animals?
Species	Does the species suit the question, and are its care needs understood?
Numbers	Use enough animals for meaningful evidence without unnecessary use.
Procedures	Consider pain, suffering/distress, housing, rewards, deprivation and aversive stimuli.

2. Procedures need specific evaluation

Pain and distress: monitor injury, fear, discomfort and social stress; use suitable stopping criteria.
Housing: assess space, social contact, temperature, enrichment and handling. Familiar housing may reduce disruption but is not necessarily ideal.
Rewards/deprivation: reward use does not justify restricting normal nutrition or water.
Aversive stimuli: assess necessity and alternatives to unpleasant stimulation.

3. Reinforcement is not punishment

Positive reinforcement adds a consequence to increase behaviour; negative reinforcement removes an aversive event to increase behaviour. Punishment reduces behaviour. A food reward may support cooperation but does not, by itself, resolve all welfare concerns.

4. Balancing numbers and alternatives

An extremely small sample can fail to answer the question, wasting welfare cost; unnecessary large samples also needlessly use animals. Human participants cannot directly reveal whether monkeys show a pattern without human toy teaching. Veterinary feasibility in elephants requires relevant animal evidence, while alternatives should still be considered.

Use of animals in psychological research

Lesson 1.5.5 | Evaluation and connections

1. Hassett: care and remaining concerns

Monkeys remained in their established social group with indoor/outdoor housing, continuously available water and normal food. An approved enrichment/management protocol and animal-care guidance were reported. Toy approach was not forced.

Group access and rank could affect interaction. A plush toy tore, and the trial ended early; loose material was a possible hazard, not a documented injury. Temporary indoor holding and safe toy selection still required monitoring. Selective participation and uncertain human transfer limit scientific justification.

2. Fagen: potential benefit and restrictions

Reward-based sessions trained four juveniles for a veterinary sampling sequence without adding aversive training. Some disengagement was possible by turning/moving away. Normal food was not withheld to make rewards work; no extra study-imposed deprivation was reported.

Existing chains limited choice. Normal management restricted water mainly to grazing, with water also offered in training. The study did not create these conditions, but existing housing and care remain relevant to welfare judgement. No comparison directly established improved welfare over another method.

3. Balanced arguments

For carefully justified use: relevant comparative knowledge or direct animal-care benefits can support limited, well-designed research.
Concern: inability to consent and risks of suffering may make some procedures unacceptable, even with potential benefits.
A judgement must weigh the particular species, alternatives, numbers, procedures, evidence quality and expected benefit.

4. Human safeguards do not transfer unchanged

Animals cannot sign informed consent or receive a verbal debriefing. Welfare monitoring and species-appropriate care must address their actual needs. Avoidance opportunities matter but should not be overstated when movement is restricted.

> Hint: Name the guideline → use a reported animal-care or research detail → explain its welfare or scientific consequence. Distinguish a potential hazard from a reported harm.

Connect arguments to exact study evidence rather than treating all animal research as one identical procedure. Ethical evaluation depends on both the animal experience and the quality of knowledge gained.