Experiments: laboratory and field

Lesson 2.1.1 | AS research methodology

Core ideas

Experiments investigate cause-and-effect by changing an independent variable and measuring a dependent variable.

Laboratory experiments take place in controlled settings, so procedures can be standardised and repeated more easily.

Field experiments take place in real-world settings, so behaviour may be more natural but harder to control.

Experimental and control conditions help researchers compare what changes when the independent variable is present or absent.

Random allocation, counterbalancing and clear instructions reduce bias and order effects.

Strong evaluation considers reliability, validity, ethics and whether findings transfer to real behaviour.

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Key terms

Experiment: A research method that changes one variable to see its effect on another.

Independent variable: The factor the researcher changes or compares.

Dependent variable: The behaviour or outcome the researcher measures.

Laboratory experiment: An experiment carried out in a controlled setting.

Field experiment: An experiment carried out in a real-world setting.

Control condition: A comparison condition without the key experimental change.

Random allocation: Putting participants into conditions by chance.

Ecological validity: How well a study reflects real-life behaviour.

Further detail and evidence

A field experiment still manipulates an IV; a naturalistic observation only records behaviour. Control means reducing alternative explanations, not merely using a laboratory. An active comparison or placebo can help distinguish the intended change from attention or expectations.

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Applying the ideas

Andrade randomly allocated adults to shape-shading or control conditions while keeping the recorded message constant. Better recall therefore supports the particular task comparison. Piliavin changed victim cues on a real train: realism increased, while passenger composition and actor differences were harder to control.

Worked example: Use the terms independent variable and dependent variable in a simple memory experiment. A researcher could change whether participants revise in silence or with background music; this is the independent variable. The researcher could then measure how many words each participant recalls from a list; this is the dependent variable. Comparing the recall scores helps test whether background music affected memory.

Worked example: Assess one strength and one weakness of laboratory experiments compared with field experiments. A strength of laboratory experiments is control: researchers can standardise instructions, reduce extraneous variables and repeat the procedure, which can improve reliability. A weakness is that the setting may feel artificial, so behaviour may not reflect real life as well as in a field experiment. This means laboratory experiments can gain control but lose ecological validity.

Evaluation and connections

Evaluate internal validity and ecological validity separately. A controlled task can identify an effect but transfer poorly to real life; a realistic field task can still contain confounds. Random allocation reduces systematic differences on average, but does not guarantee identical small groups. Covert field work can raise consent, withdrawal and debriefing concerns.