

Solutions

2.1 IV: coffee or no coffee (1); DV: reaction time in milliseconds (1). Research hypothesis: students who drink a cup of coffee will have faster reaction times than students who drink water (1). Null: there will be no difference in reaction time, or any difference will be due to chance (1).

2.2 (a) repeated measures; (b) independent samples (random allocation); (c) matched pairs (1 each).

2.3 Half the participants do condition A first and half do B first (1), so order effects such as practice or tiredness are balanced across the conditions (1).

2.4 (a) opportunity; (b) self-selected; (c) snowball (1 each).

2.5 $18 \div 24 \times 100 = 75\%$ (1). Any one: clearer category definitions; train the observers together on a practice video (1).

2.6 Informed consent: covert observers do not ask (1). Afterwards: debriefing with the true aim, the right to withdraw their data, and confidentiality (any two, 1 each).

3.1 Aim: whether students who sleep less report a worse mood (1). We gave an anonymous questionnaire to 30 DP1 students (opportunity sample) after they gave informed consent (1). It had closed questions, including hours of sleep last night and a 1–5 Likert scale for mood (“I felt cheerful today”) (1). We calculated mean mood scores for students who slept under and over seven hours; anonymity reduced social desirability bias (1).

3.2 Both ask people about their own experience, so both depend on honest answers (1). A questionnaire reaches many students quickly and gives numbers that are easy to compare (1); an interview gives fewer participants but rich detail (1). Interview follow-up questions can explore reasons (“Why did that test feel different?”) that fixed items miss (1). Questionnaires, especially anonymous ones, reduce social desirability bias; in an interview the student may want to look calm in front of the researcher (1). For experience, the interview fits the question better; a questionnaire suits measuring how common stress is (1).

3.3 Causality: there was no control group, so the fall could be due to time (the exam season ending) or expecting to feel better (1); the study cannot show that the app caused it (1). Improvement: randomly allocate volunteers to the app or a waiting list (1). Bias: volunteers who choose a mindfulness study may already believe in it, and the sample is from one university (1); the result may not generalise (1). Measurement: a self-report stress score can be affected by demand characteristics; a cortisol measure would add an objective DV (1).

3.4 Method: semi-structured interviews, because the question is about experience and needs rich data (1). Sample: purposive sampling of about eight boarders, through the boarding staff (1). Ethics (any two): informed consent from students and from parents for those under 16; the right to withdraw; no names in the report; information on who to talk to if the interview is upsetting (2). Analysis: thematic analysis with a second coder (1). Limitation: eight boarders in one school may not transfer to other schools (1).

Review guidance: the aim, the sample, the instrument and the analysis; an operationalised DV; (R1 3.3) each concept tied to a detail of the study and an improvement.

Authored guidance.