

## Chapter 2: How to design a psychological research study. The basics of methodology.

### Full answers to study questions

1. For each of these designs there are many possibilities. These are just my suggestions. All assume that the data are collected when the participants are adults, but you could also have designed studies with children as participants.
  - 1.1. The first categorical variable is already specified as whether the child attended a nursery before the age of two years old? Yes or no. The second variable needs to measure the "cognitive abilities" variable. A two category variable could be whether they completed a university degree: yes or no. A three category variable could be the highest level of education completed: A-levels, undergraduate degree or postgraduate degree.
  - 1.2. The IV needs to be two groups, so an obvious choice is whether the participant attended a nursery before the age of two years old? Yes or no. The DV then needs to be some measure of cognitive ability, so perhaps an IQ test could be used to give each participant an IQ score.
  - 1.3. For a correlational design you need two continuous variables. The variable to measure cognitive ability is relatively simple as we could measure IQ. The other variable needs to be a continuous variable that addresses nursery attendance before the age of two, which is more difficult! Perhaps we could ask the amount of time that the child attended a nursery for before they turned two.
2. The answers to these next questions will depend a little on your correlational design.
  - 2.1. For the IQ variable, we will use a well established IQ test, such as Raven's Progressive Matrices, and this will provide a standardised IQ score. Time spent at nursery before the age of two could be measured in months.
  - 2.2. One possible confound could be the child's parent's level of intelligence. This could influence both of the variables as cognitive ability is partly heritable (so a parent with high IQ is likely to have a child with high IQ) and it might be that a parent with a higher level of cognitive ability is more likely to return to work and therefore their child may be more likely to attend a nursery. This could be measured as a co-variable by also measuring the parent's IQ. Another possible issue could be the quality of the childcare, as higher quality childcare might be associated with greater cognitive benefits than lower quality childcare. There are various ways this could be measured, such as staff-child ratios or the level of training of staff.
3. These answers all relate to the IQ variable, measured using Raven's Progressive Matrices.

- 3.1. Convergent validity: It would be good to use a very different form of intelligence test to validate the measure. Perhaps the National Adult Reading Test.
- 3.2. Divergent validity: A number of variables could be expected to not correlate with IQ, such as height, or perhaps the amount of chocolate eaten per week?!
- 3.3. Internal validity: To ensure internal validity, we might measure maternal IQ as a possible co-variable, and we would want to sample our participants to ensure that we get a wide range of IQ scores.
- 3.4. Inter-rater reliability: Scoring on this measure is very objective, so this wouldn't really be an issue.
- 3.5. Test-retest reliability: This has been looked at in a number previous research papers, and the measure has a high level of test-retest reliability.
- 3.6. Internal consistency: Again, this is well established in previous research, with Cronbach's alpha usually being around .8 to .9, showing a good to excellent level of reliability.
4. For this study, I would avoid using an opportunity sample of university students as they are likely to all have high levels of intelligence, which may bias our findings and threaten the internal validity of the study. Instead I would use a volunteer sample, advertising in the local community to ensure a more representative sample with a wide range of IQ scores.