

Problem Set Session 2

1. A developmental psychologist wishes to test the following proposition, *Reading at home to preschool children leads to faster acquisition of reading skills at school*. The psychologist considers a number of measures of (a) reading skill and (b) reading at home. Classify the measures as ratio, interval, ordinal or categorical.

(a) Reading skill

- (i) A teacher is asked to rank the students in her class from best to worst reader.
- (ii) A teacher is asked to group students into below average, average and above average readers.
- (iii) Children are asked to read a standard set of words which vary in difficulty; the number of correct words is recorded as a measure of reading ability.

(b) Reading at home

- (i) Parents are asked to record if they "regularly read to their children", "occasionally read to their children" or "never read to their children".
- (ii) Researchers observe parents reading to children at home and record the number of minutes parents spend reading to their children.
- (iii) Parents are asked to estimate the average time in hours per day they spend reading to their children.

2. Calculate the means for each of the following data sets.

- (a) 3, 7, 7, 5, 6.
- (b) 12, 10, 2, 12
- (c) 4, 4, 4, 4, 6, 6
- (d) 4, 4, 4, 4, 6, 27

3. A researcher conducted a study on sleeping behaviour using two groups of first year students. One group comprised heavy coffee drinkers and the other group did not drink coffee at all. Students recorded their average sleeping times over the period of a week. The average sleep time in hours was as follows:

Coffee drinking group: 5.5, 6.2, 6.0, 5.8, 6.0, 6.0, 5.8, 6.2, 6.5

No coffee group: 6.5, 7.5, 7.2, 6.8, 7.0, 7.0, 6.8, 7.2, 7.0

- (a) Calculate the means for both groups.
- (b) Calculate the range for each group. (The range is just the largest score minus the smallest score – it is a very simple measure of variation).
- (c) Which sample tends to sleep more?
- (d) Do the scores of each group overlap?
- (e) Is there evidence that drinking coffee is associated with less sleep?

4. The same researcher realises there might be a flaw in the study. The students measured their sleep times during their first week at university. They have not yet had a chance to establish a normal routine and so their sleep times may not be typical. The researcher

repeats the study late in the first semester by which time all students have settled into a standard routine. The new data is:

Coffee drinking group: 4.5, 7.0, 6.0, 5.0, 6.0, 6.0, 5.0, 7.0, 7.5

No coffee group: 5.5, 8.5, 8.0, 6.5, 7.0, 7.0, 6.0, 7.5, 7.0

- (a)** Calculate the means for both groups.
- (b)** Calculate the range for each group. (The range is just the largest score minus the smallest score – it is a very simple measure of variation).
- (c)** Which sample tends to sleep more?
- (d)** Do the scores of each group overlap?
- (e)** Is there evidence that drinking coffee is associated with less sleep?