

Department of Psychology
University of Strathclyde

Name: Roy Hunter

Class: Quantitative Methods

Title of Coursework: Measurement Practical

Deadline: 19th November

I affirm that this essay/lab report is my own work, and that it does not include any unacknowledged material from any other source.

Signed:

Date:

Perception of Gender

Table 1: Total number of correct responses from a random sample of 20 participants.

	Full View	Eyes Only	Mouth only
<i>Number correctly identified as men</i>	73	54	37
<i>Number correctly identified as women</i>	69	55	42

1. What were the independent variables in the Perception of Gender Experiment?

The independent variables were the amount of the face exposed to the participant: eyes only; mouth only; full view.

2. What was the dependent variable?

The dependent variable is the number, or score, of correct gender identifications, either men or women, for each face viewing condition.

3. What scale best describes the dependent variable and why?

Ratio. The dependent variable is numerical and has a meaningful zero point (zero correct identifications), and a score of two is twice as many identifications as a score of one, so the numbers themselves are meaningful.

4. Is the scale continuous or discrete? Again, give reasons for your answer.

Discrete. There are no fractions of correct or incorrect identifications, so it is a scale of discrete, whole numbers.

5. What is the most appropriate way of illustrating the data and why?

A bar chart would be a good way to illustrate this data. The nominal independent variable could not be put into a histogram, and a pie chart may not display the tendencies we are looking for as well as a bar chart.

6. Considering the data on levels of **Confidence** what was the dependent variable?

NB Remember that you were asked to place an arrow somewhere along a line from 'least confident' to 'most confident'. The computer then measured in centimetres how far along the line you had placed the arrow.

The dependent variable in the confidence aspect of the experiment was the distance along the line the participants placed the arrow, thereby indicating their degree of confidence in their gender identification choice.

7. What scale best describes this dependent variable and why?

Interval. The variable is being measured numerically, in centimetres, but it does not have a meaningful zero point (least confident is not an absolute). I am not even sure whether you would measure this variable from the left-hand end of the line, the other end, or starting from the middle.

8. Is the scale continuous or discrete and why?

Continuous. The computer can measure down to tiny fractions of a centimetre, and there is no compulsion for the participants to place the arrow on the nearest whole centimetre along the line, so it is not a discrete scale.

9. What measure of central tendency is appropriate for this type of data? Again, give a reason for your answer.

Central tendency in interval and ratio scales can be measured using mean, median or mode. If the data were distributed normally, a mean would be appropriate. If the data were skewed, a median would be more appropriate.

10. What conclusions can be drawn from the results in table 1?

It is more likely that a participant will correctly identify the gender of a face when they see the whole face than when they see part of it, and that they are more likely to correctly identify gender when shown the eyes only than the mouth only. There is no significant difference between correctly identifying men and women in this experiment.

Visual Reaction Time Experiment

Table 2: Average reaction time measured in seconds by condition, for a sample of 20 students.

Simple	No-Go	Choice
.48	.77	.68
.35	.70	.99
.52	.72	.68
.31	.68	1.37
.17	1.01	1.11
.37	.57	.92
.43	.64	.75
.48	.67	.66
.27	.52	.82
.46	.62	.76
.51	.75	.62
.46	.62	.76
.51	.75	.62
.46	.57	.66
.33	.78	.82
.37	.77	.70
.47	.88	.79
.53	.79	.81
.57	.93	.79
.55	.88	1.01
.53	.80	1.22
.54	.94	.67

1. What type of scale is this data reported on and why?

Interval. The data is measured in seconds which are numerically meaningful, but the scale has no meaningful zero point because no-one can react in exactly zero seconds. Such a datum would be a confounding variable.

- Using the graph paper provided draw three histograms that illustrate the reaction times for each condition.
- Considering each condition in turn, what type of central tendency should you use to describe the data and why?

Simple – median. The histogram displays a negative skew to the data, so a mean would be an inappropriate measure of central tendency. A median is a better measure of central tendency than a mode for skewed interval or ratio data.

No-Go – mean. The histogram displays no significant skew, so a mean would be more accurate than a median or a mode.

Choice – median. The histogram displays a positive skew to the data, so a mean would be an inappropriate measure.

- Again, considering each of the conditions in turn, what is the appropriate measure of dispersion associated with the central tendency and why?

Simple – Interquartile. The data is skewed, so a mean would give an inaccurate central tendency, and therefore an inaccurate standard deviation.

No-Go – Standard Deviation. The data is not significantly skewed, so a mean would be a useful measure of central tendency, from which a standard deviation can be derived.

Choice – Interquartile. The data is skewed, so a mean central tendency and standard deviation dispersion would be inappropriate.

5. What type of distribution does each condition show and why is it described like this?

Simple – The data displays a negative skew in its distribution. It is described as a negative skew because the most frequently occurring data range (the mode) is not in the middle of the distribution (as expected of the mean), but of a higher value.

No-Go – The data displays no significant skew. The three measures of central tendency are of approximately the same value.

Choice – The data displays a positive skew. The median and mode values are of a lower value than the mean.

6. What does the difference between the reaction times across the conditions tell us about the speed with which people make decisions?

The relative positions of the distributions tends to suggest that the more complicated the decision to be made, the longer it takes to make it. The fact that the 'outer' two curves seem to be skewed towards the middle may be significant, but I have no idea how or why (see diagram 4).

7. The PsychExp site also has an auditory reaction time experiment, why do you think this might be?

It may be to try and establish if there is a difference between visual reaction time and auditory reaction time, or it may just be that visually impaired participants would be unable to take part in a visual reaction time experiment.

8. How valid and reliable do you consider this experiment of visual reaction time to be? Please give full reasons for your answers.

There is no real control of the environment that the experiment takes place in. It takes place in both quiet and noisy rooms, first thing in the morning and late in the afternoon when people are tired, and it also takes place on computers of various ages and speeds (some keyboards, particularly USB powered ones, have a higher latency time than others).

9. How could you improve the reliability and validity of this experiment?

An internet-based experiment cannot actually control the environment that it takes place in, but it could at least ask the participants to ensure that they have a quiet, non-distracting environment before they start, it could compare results from similar local times of day, and the software could be set up to accommodate differences in computer hardware.

The Personality Questionnaire

Table 3: Rank given to the item “finding the meaning of life” from a sample of ten participants in each of two age groups.

18-20 years old	30-40 years old
3	2
2	4
4	5
2	2
4	3
1	4
3	4
3	4
1	3
1	5

1. What are the dependent and independent variables for this experiment?

The independent variable is the age range of the participants. The experimenters have manipulated the age ranges to try and produce a meaningful difference between one group and the other.

The dependent variable is the rank given to the ‘meaning of life’ statement by the participants in the experiment.

2. What scale best describes the data and why?

Ordinal - The dependent variable is numerical, but there is no meaningful zero point (you cannot place an item in ‘nothingth’ place in a list), so it is not ratio, and you cannot say that first is twice as important as second, or fourth half as important as second, so it is ordinal rather than interval.

3. What measure of central tendency best describes the data and why?

The median is the best measure of central tendency for numerical ordinal data. The mode would be the most appropriate measure of central tendency for non-numerical ordinal data on a scale like 'best to worst'.

4. Is the scale continuous or discrete and why?

The scale is discrete – the rankings are whole number values only.

5. Summarise the data in Table 3 using the appropriate measure of central tendency and illustrate these results on the graph paper provided.

These data are a sample of twenty scores taken from a significantly larger population. The data are ordinal and discrete. They are divided into two equal samples, one from each age range.

18-20 – see diagram 5.

Due to the small size of the sample, it is difficult to determine any significance in its distribution. This sample has a median of 2.5 and an interquartile range of 2.5. The sample is bi-modal (1 and 3).

30-40 – see diagram 6.

Again, due to its small size it is difficult to determine the distribution of this sample, although it may have a slight negative skew. This sample has a median of 4 and an interquartile range of 2. The sample has a single mode (4).