

**a)** Suppose you are interested in estimating the mean Extraversion levels of university students at the UvA, and you have a sample of 20 students. Using the data in the Excel file below, estimate the population mean Extraversion level using a 95% confidence interval. [3 points]

Excel data:

**b)** Additionally, explain in your own words what the sampling distribution of the mean is [1 point], and

**c)** how increasing the sample size of an experiment affects this distribution [1 point].

Answers on next page

1.

correct calculation:

$$\bar{x} = (12+18+14+15+16+13+19+20+17+14+12+15+13+16+14+11+17+12+18+15) / 20 = 15.05$$

$$s = 2.5438$$

$$SE = s / \sqrt{n} = 0.5688$$

The critical t-value is 2.093 for a two-tailed test.

$$CI = 15.05 \pm 2.093 * 0.530 = (13.8595, 16.2405)$$

(1 punt correcte mean/s/se, 1 punt per correcte bound gegeven)

2.

sampling distribution of the mean:

- if we were to repeat an experiment over and over, each time compute the mean/statistic, and then make a histogram/distribution plot of those means
- describes the behavior of the statistic when repeating an experiment over and over

(any of the above points -> 1 point)

3.

Increasing sample size affects the sampling distribution:

- by making the standard error smaller -> creates a more narrow distribution