How People Learn

Solutions for Exercises for Week 3

Note: In social surveys and psychological research it is common to ask multiple questions addressing the same underlying question and then aggregate the results. This is called *building a scale*. Last week the exercises focused on a scale for Metacognitive Self-Regulation (if you are not sure what that means, look at your notes from the week 1 videos).

We build scales because scales typically provide measures which are more valid and reliable than a single question would be. They are more valid because they make the concept operational; instead of asking "are your good at managing your own thinking and learning process" we ask lots of questions about planning for learning, monitoring of learning, strategies for learning etc. all of which are easier to answer than the very general question "are your good at managing your own thinking and learning process".

Question 1

(a)

So the average score represents someone's score on Metacognitive Self-Regulation as a whole.

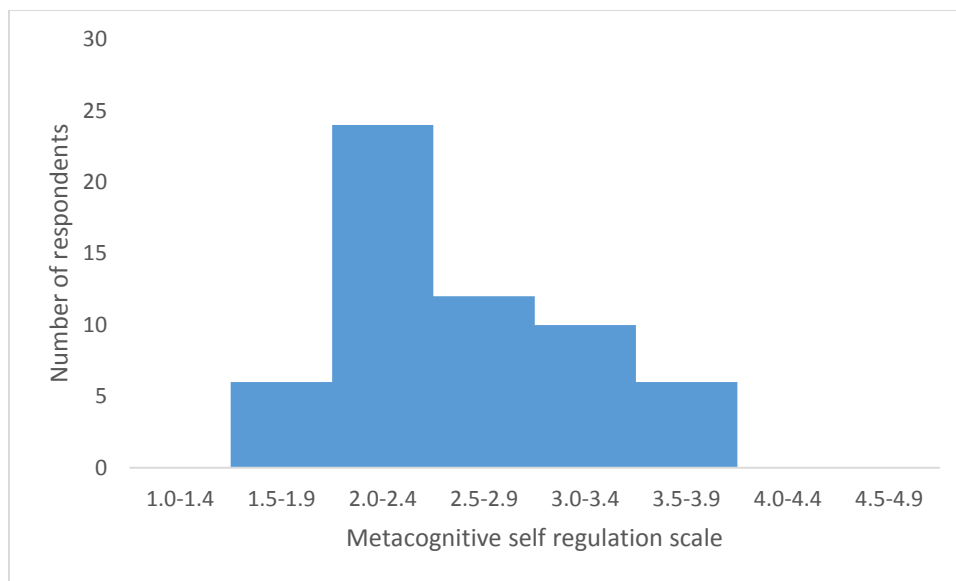**Chart 1: Stem and Leaf plot of the Class Metacognitive Self-Regulation Scale Score.**

1	
1	5 5 7 8 8 8
2	0 0 0 1 1 1 1 2 2 2 2 3 3 3 3 3 3 3 3 3 4 4 4 4
2	5 5 6 6 6 6 6 7 7 7 8 8
3	0 0 0 0 1 1 1 1 2 2
3	5 5 5 7 9 9
4	
4	

1 | 3 represents 1.3

Note: Data from class survey.

(b)

Chart2: Distribution of Metacognitive Self-Regulation Scale Scores in the HPL Class

The distribution of scores in the class is right-skewed, and unimodal.

The mean average score for the class is 2.5.

Note: The stem and leaf plot shows the same data as the histogram. The stem and leaf plot includes additional data which can be useful for analysis purposes (as you will see in question 2, below). You can also see from the stem and leaf plot of organizing your data differently would produce a different shaped distribution (ask yourself, for example, if we used step sizes of 0.2 units instead of 0.5 units would the distribution still be unimodal)? The histogram cuts out this additional data therefore has a neater look. The stem and leaf plot is useful for analyzing data, the histogram is perhaps more useful for presenting it to others.

Question 2

Lowest extreme: 1.5

Q1: 2.2

Median: 2.4

Q3: 3

Highest Extreme: 3.9

The mean is higher than the median. This reflects the fact that there is a right skew in the distribution. Given this skew, the median is probably a better measure of central tendency, but the difference between them is small and it would be reasonable to use the mean in this case.

You know about metacognition from the Week 1 video and from the notes above.

Question 3

Chart 3: **Distribution of Metacognitive Self-Regulation Scale Scores in the HPL Class**
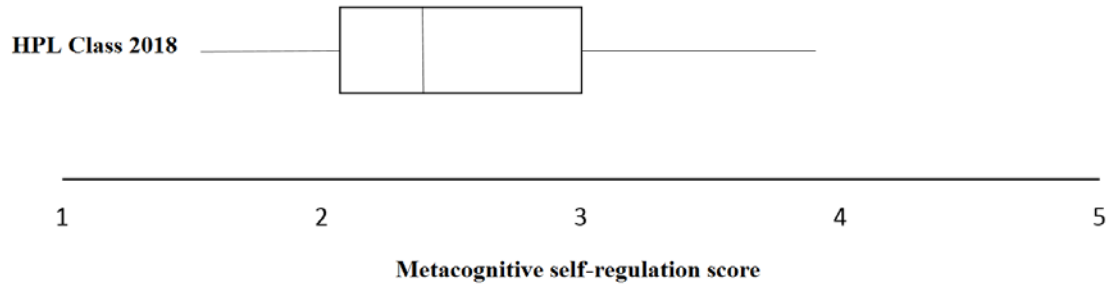
Note: A box plot is a third way of representing continuous data, alongside the histogram and the stem and leaf plot. The histogram is perhaps less easy to read than the histogram but will come into its own when we want to compare how the distribution of data differs for different groups (next week)…