Are males better drivers? Student worksheet

http://topdrawer.aamt.edu.au/Statistics/Good-teaching/Statistical-investigations/Semi-structured-statistical-investigations/Are-males-better-drivers

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A claim to investigate

Billy, one of the males in your class, has made an observation that the reaction times of males are faster than that of females. He went on to say, 'For driving a car, quick reactions are important. Males will be better drivers than females because they have faster reaction times.' Needless to say, this created some controversy in your class.

With a partner, discuss what you think about the accuracy of Billy's claim.

Task 1: Comparing the reaction times of males and females

You, Sammi and Jasmine are unsure about the accuracy of Billy's claim, so you decide to investigate if males do have faster reaction times than females.

Data from the CensusAtSchool questionnaire could be used to investigate the reaction times of females and males.

Sammi suggests that a simple calculation of the mean reaction time for females and for males will give us the answer. Jasmine is not sure. She thinks that median should be used to measure the middle of a set of data. 'They always use the median house price, don't they?'

Sammi also thinks it might be best to use functions in Excel. It will be easy to calculate both. Then it might be easier to decide which is better. He is also uncertain about which reaction time to use.

1. In a group, discuss how to investigate the claim and record the steps you need to carry out your investigation.

    It would be a good idea to test your own reaction and concentration times before you analyse the results so you understand what is being measured. These data were collected in the 2006 survey (questions 11, 12 and 32) and the 2008 survey (questions 9, 10 and 31).

    You can go to the CensusAtSchool website and obtain a sample from the random sampler or you can ask your teacher for a copy of a prepared sample from the web pages.

2. Carry out and record your investigation. Include any tables you used.

3. What can you conclude from your investigation?

Task 2: Does one number tell you enough?

Jasmine is not happy with a conclusion that is based on just one number, such as a mean or median. She says that this only gives a limited picture. The mean tells you nothing about the rest of the data. Sammi wants to know about all the data and suggests that a graph such as a histogram would give a more complete picture.

Jasmine has seen box-and-whisker plots and stem-and-leaf plots and thinks they are good. They could be clearer than a histogram. She thinks that drawing parallel box plots or back-to-back stem-and-leaf plots of males' reaction times with females' reaction times will enable a better comparison to be made. You can draw a box plot using the quartile function in MS Excel and then draw the box plot by hand. You can also draw a box plot in Excel if the Add-in has been added to the tools menu.

4. Decide on a way you can show 'all the data' and carry out the task. Record the results of your method.

5. Comment on any additional information you have gained from examining 'all the data'.

Task 3: Can you say that driving ability is related to reaction time?

6. What makes a good driver? You might like to do some research on this question to support your presentation.

Extension

7. Prepare a short presentation to your class addressing the claim that males make better drivers than females.

    Any conclusions you draw must be based on the CensusAtSchool data or other research you have conducted. Remember that people generally find graphs and diagrams easier to understand.