**Student 1: Low Excellence**

NZQA Intended for teacher use only

I investigated possible bias in questionnaires from using anchors. I wanted to find out if you could get people to give higher answers for a question by using an anchoring question before it. This would be important to take into account when using questionnaires to collect data so you don't unknowingly influence answers, or something that might be used in questionnaires to trick people into giving a certain answer.

I spent some time researching each of the different types of questionnaire bias given in resource A, and it seemed to me that anchoring effect would be interesting to investigate because of the applications of this to everyday life. In my research, I found examples of how 1
people use anchoring bias when selling cars to persuade people into paying more. The research about anchoring bias shows that when people are uncertain about something, they use whatever information is available to help them decide, even if the information is not valid or reliable. I wanted to do a similar experiment, so my investigative question was "will higher estimates be given for the number of people who live in Venezuela if a larger number is used for the anchor?" I used Venezuela for my experiment as I thought that it was a country not many people would know exactly how many people lived there, and for the experiment to work people have to be unsure about the answer or amount for the anchor to have an effect. The research suggested that the higher the number I used in the anchor, the higher the estimates of the number of people who live in Venezuela would be, and so this is what I expected to find in my experiment.

I used a comparison of two independent groups for my experiment, where one group was given a high anchor and one group was given a value close to the real value. I used 57 Year 13 students. I used single blinding, where the participants didn't know which treatment they were getting. In fact, I concealed the fact that it was an experiment at all by presenting the questionnaire as a general knowledge survey.

The response variable was the estimate for the number of people in Venezuela (in millions).
The treatment variable was the number used for the anchor. I had two treatment groups: for 2
one group the anchor was 60 million, for the other group the anchor was 30 million. I used these two numbers as the population of Venezuela is around 29 million.

I created two different questionnaires for my experiment. I included an introduction for the questionnaire used in the experiment that said it was a general knowledge survey, and asked a couple of other questions in the questionnaire so that people would not guess the point of my experiment. In my questionnaire, I decided to ask people to estimate of the number of people in Venezuela to the nearest million because I was confident this would still give me enough variability in the estimates and it would be easier for people to answer the question. The two versions of the questionnaire are exactly the same, except for the number used for the anchor in the question before the one that asks people to estimate the number of people in Venezuela. For this experiment, it was important that people didn't realise there were two different versions of the questionnaire. Before we gave them to students to fill out, we turned the questionnaires upside down and thoroughly shuffled them into a pile to hand out. This was done to make sure that each student did not know which of the two questionnaires they were getting. In this way, we would be randomly allocating students to one of the two treatment groups when the teacher gave out the questionnaires to complete.
There are some factors (identified from my research) I couldn't control for my experiment:

- whether people already know the population of Venezuela (maybe people who had been travelling or international students from South America)
- whether people would take the survey seriously and not give silly answers 5

- whether people were aware of the anchoring bias (which maybe students doing psychology might know about)
- whether some people had better general knowledge than others

By randomly assigning people to one of the two treatment groups, I attempted to balance the possible effect of these variables on the estimates across the two groups.
The variables I controlled for my experiment were:

- giving the same instructions to people about completing the questionnaire
- both groups doing the experiment at the same time of the day (
- same test conditions used for completing the questionnaire
- an independent person carrying out the experiment (the teacher of the class) so that I didn't influence the results if I was the handing out the questionnaires 3

**Rerandomisation**
I found the median estimate of the population of Venezuela for each group and the difference was 19 million. Using the result from the rerandomisation test, I have very strong evidence that the use of an anchor of 60 million would cause estimates that tend to be higher than when a 30 million anchor is used. This is because when I compared the observed difference between the group medians (19 million) to the distribution of re-randomised differences, a difference of 19 million or higher came up only twice in a 1000 re-randomisations. This shows that it would be very unlikely that a difference as large as 19 million could happen just by chance. It is this test result that provides me with the very strong evidence that 4 chance was probably not acting alone in this experiment but something else, namely the anchor effect, was acting along with chance to create the observed difference of 19 million.

I thought that the experiment turned out reasonably as planned, although not everyone completed the survey correctly, so I couldn't use all the results (see my notes in the appendix). However, there weren't many incomplete or invalid responses, so this shouldn't have affected my data too much. I could have had the teacher check the questionnaires as they were handed back so that responses could be clarified.
The result from the randomisation test, the fact that my experiment was well designed and executed means that I can claim that, for this group of students, an anchor of 60 million is likely to cause estimates that tend to be higher than when a 30 million anchor is used. My results, if we can widen them to beyond this group of students, are important in terms of how they apply to questionnaire design, and the importance of making sure that anchors are not used that may influence people's answers to questions in the questionnaire.
I wonder how much the numbers I used for each of the treatment groups (the numbers for 6 the anchors) affected the estimates? When I looked at the data for the two treatment groups, it seemed that people were not confident estimating the number of people in Venezuela to be as high as 60 million (the median estimate was 43 million for the group with this anchor). Maybe if I had used a value like 100 million they would have ignored it because it would have been unrealistic. Would I have got the same result (my conclusion that a larger number for the anchor would result in (cause) estimates that tend to be higher) if I used a high anchor of 40 million? So perhaps anchors can influence people's responses to answers, but only if they are a certain value.