QRMS Project 3: Parapsychological Testing, Part 2 (Due December 5th, 2011)

In part 1 of this project, you submitted data to me. The 64 data points I received are summarized in the following frequency table, where the first column gives the number of correct responses out of 52 and the following three columns give data from the three steps of the project:

Number Correct	Step 1	Step 3	Step 5
2	0	1	0
4	0	0	1
6	2	0	1
7	0	1	0
8	3	1	0
9	3	1	0
10	8	3	3
11	9	5	4
12	5	4	7
13	7	10	6
14	3	5	11
15	1	3	5
16	4	5	4
17	8	4	7
18	5	3	1
19	4	3	2
20	0	1	2
21	1	5	1
22	1	4	5
23	0	0	1
24	0	1	1
26	0	0	1
27	0	3	0
31	0	1	0
52	0	0	1

For this experiment, a result is statistically significant at the 0.05 level if at least 19 predictions were correct and statistically significant at the 0.01 level if at least 22 predictions were correct.

Part 2: Analysis

In this part, you will present your results in the form of a typed paper of about 1-2 pages in length (not including graphics). Please follow the guidelines for formal writing: don't just make a list.

1. Begin by describing what it is that we're attempting to test and the methods that you used in Steps 1 and 5 of Part 1. Do you think that your data in Step 1 were reliable? What about your data in Step 5?

2. If everyone were just guessing, what would you expect the distribution of their number of correct guesses to look like? (See Units 6B-6C.) What would you expect the mean to be? (See

Unit 6A). Explain why.

3. Make an appropriate graphic summarizing the above frequency table. It may be hand-drawn or computer generated. You may bin the data if you think that it makes it easier to understand. You may put all three trials on one graph, or use three graphs. (See Unit 5C.)

4. Looking at your graphic, what do the distributions of the data from Steps 1, 3, and 5 look like? Use the frequency table above to compute the mean for each Step. How does this differ from your prediction above? (Since we're dealing with real-world data, it's extremely unlikely that it'll exactly match your above predictions.) How would you explain these differences? (In particular, you might want to consider 1) why each distribution has a different mean and what that tells us, 2) how many peaks each distribution has and what this tells us, and 3) which distribution looks closest to normal and why this is.)

5. We would expect to have some statistically significant results just by coincidence. Out of the 64 data points in each Step, how many would you expect to be significant at the 0.05 level just by coincidence? (See Unit 6D. Hint: think about what the term "0.05 level" means.) How many data points were actually significant at the 0.05 level in each Step? For each step, do you think that the number of results that are statistically significant at the 0.05 level is significantly higher than what would likely occur by coincidence? If so, what are some possible explanations (at least two) for why this may have happened? (Note that these explanations will probably be different for the different Steps.)

6. A study in which data from multiple experiments are combined together (such as this one) is called a meta-analysis. Such studies are sometimes criticized because the exact procedure may be different in each of the individual experiments. Do you think that that would be an issue in a study such as this one?