PSYC 5301: Research Methods

1. Kruger and Dunning (1999) asked 11 participants to estimate at what percentile he or she scored on a test of logical reasoning. The observed data were as follows:

$$40, 58, 72, 73, 76, 78, 52, 72, 84, 70, 73.$$

   Kruger and Dunning were interested in whether the reported percentiles were greater than 50 (i.e., whether "all children were above average").

   (a) If μ denotes the population mean of reported percentiles in this study, construct and interpret a 95% confidence interval for μ

   (b) Use a t-test to compare $\mathcal{H}_0 : \mu = 50$ against $\mathcal{H}_1 : \mu > 50$.

   (c) Explain in context what you can conclude from your work on parts (a) and (b).

2. Katz et al. (1990) examined the performance of 28 students who answered multiple choice items on the SAT without having read the passages to which the items referred. The mean score (out of 100) was 46.6, with a standard deviation of 6.8. Random guessing alone would have been expected to result in 20 correct answers. Were these students responding at better-than-chance levels? Use both parameter estimation and model comparison to determine your answer.

3. Consider the sample $\{1, 1, 1, 2, 2, 2, 3, 3, 3, 4, 4, 4, 5, 5, 5\}$.

   (a) Compute the 95% confidence interval for the mean μ.

   (b) Suppose you constructed a 99% confidence interval. Would it be wider or narrower than the 95% confidence interval? Explain.

4. What happens to the width of a 95% confidence interval as the sample size increases? Explain.