

SOLUTIONS TO

TEST YOUR KNOWLEDGE: Two-Sample Z-test

1. A researcher is interested in comparing the happiness scores of married and single men. The data is below:

Married Men: average happiness rating = 8.7; standard deviation = 1.4; n = 100

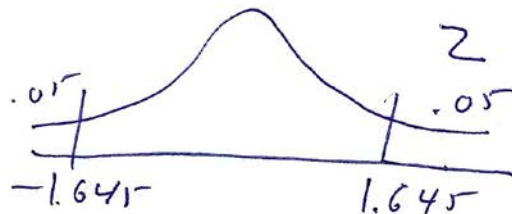
Single Men: average happiness rating = 7.9; standard deviation = 1.2; n = 80

Test whether the difference between the means of the two groups is significant at an alpha (significance level) of .10.

- (a) What are the null and alternate hypotheses?
- (b) Draw the picture of the distribution of the test statistic (under H_0). Include critical value(s) and region(s) of rejection.
- (c) What is the calculated (computed) value of the test statistic?
- (d) What is your conclusion?

$$H_0: \mu_1 = \mu_2$$

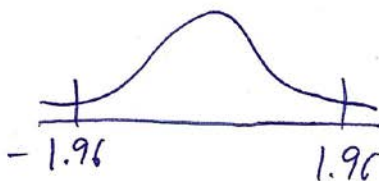
$$H_1: \mu_1 \neq \mu_2$$



$$Z = \frac{8.7 - 7.9}{\sqrt{\frac{(1.4)^2}{100} + \frac{(1.2)^2}{80}}} = \frac{.8}{\sqrt{.0196 + .018}} = \frac{.8}{\sqrt{.0376}} = \frac{.8}{.194} = 4.13 \text{ reject } H_0$$

(e) Construct a 95% CIE for the difference between the happiness scores of married men and single men.

(e) 95% CIE



$$.8 \pm \frac{1.96 (.194)}{.38}$$

$$\frac{.42 \leftrightarrow .118}{95\% \text{ CIE}}$$