**SECTION MEETING RECAP: 10/15/14**

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**Homework**: Get access to SPSS.

**Confidence interval**: the plus-or-minus figure usually reported in newspaper or television opinion poll results. For example, if you use a confidence interval of 4 and 47% percent of your sample picks an answer you can be "sure" that if you had asked the question of the entire relevant population between 43% (47-4) and 51% (47+4) would have picked that answer.

**Confidence level:** tells you how sure you can be. It is expressed as a percentage and represents how often the true percentage of the population who would pick an answer lies within the confidence interval. The 95% confidence level means you can be 95% certain; the 99% confidence level means you can be 99% certain. Most researchers use the 95% confidence level. When you put the confidence level and the confidence interval together, you can say that you are 95% sure that the true percentage of the population is between 43% and 51%.

🡪 The wider the confidence interval you are willing to accept, the more certain you can be that the whole population answers would be within that range (i.e., 99% confidence interval is better than 90%).

🡪Each confidence interval corresponds to a predetermined z-score (i.e., you do not calculate your own z-score)

 -these can be found in the z-table in the back of the text book

 🡪.90 or 90% confidence interval: 1.645

 🡪.95 or 95% confidence interval: 1.96

 🡪.98 or 98% confidence interval: 2.326

 🡪.99 or 99% confidence interval: 2.576

**Factor Affect Confidence Intervals:**

(1) Sample size: The larger your sample, the more sure you can be that their answers truly reflect the population. This indicates that for a given **confidence level**, the larger your sample size, the smaller your **confidence interval**.

(2) **Percentage:** Your accuracy also depends on the percentage of your sample that picks a particular answer. If 99% of your sample said "Yes" and 1% said "No" the chances of error are remote, irrespective of sample size. However, if the percentages are 55% and 45% (as in the Baker v. Coakley example), then the chances of sampling error are much greater. It is easier to be sure of extreme answers than of middle-of-the-road ones.

**Formulas**

-Standard Deviation of Sample Mean (when the proportion of your sample is known; ex., 55%)

s = $\sqrt{\frac{\left(p\right)\*\left(q\right)}{N}}$ = $\sqrt{\frac{\left(Proportion favoring Coakley\right)\*\left(1-Proportion favoring Coakley\right)}{\#of Sample}}$

-Standard Deviation of Sample Mean (when the population S.D. is known)

s = $\frac{θ}{\sqrt{N}}$ = s = $\frac{Population Standard Deviation}{\sqrt{\# of Sample}}$

 -Confidence Interval:

 $C.I. = Mean + (z\\_score)(Standard Deviation of the Sample Mean)$

 -Ex) Upper Limit 95% Confidence Interval: 500 + (1.96)(10) = 519.6

 -Ex) Lower Limit 95% Confidence Interval: 500 + (-1.96)(10) = 480.4

Conclusion:

🡪 You can say with 95% confidence that your random sample mean falls between 480.4 and 519.6.

**Other take-away points:**

-The distribution of sample means will be tighter (less variable, less dispersion) than the distribution of single scores.

-As the sample size increases, the Standard Deviation of the Sample Mean gets smaller.