

Lesson 59: Comparing proportions from two groups (confidence interval)

Daily Data Collection

The two groups will be males and females.

Question: When eating cereal, do you drink the milk at the end?

Find a 95% confidence interval for Males and Females that said yes.

Decide if the proportion who drink milk is different for males and females.

Old Thinking

	Males	Females
Said Yes =		
N =		
Proportion =		
Z =		
St. Dev =		
Error =		
Interval =		

Conclusion:

New Thinking

	Males – Females
$P_m - P_f =$	
Z =	
St. Dev. of $P_m - P_f =$	
Error =	
Interval =	

Conclusion:

Examples:

Thinking about the upcoming prom, Andrew is pondering whether he should expand his date opportunities and ask some girls out from Greenon HS hoping that his chances would be better there. He conjectures that a higher proportion of GHS seniors attended the prom last year than NWHS seniors. He takes an SRS from each school and gets the following data:

Population	Sample size	# of seniors who attended the prom last year
NWHS Seniors	25	15
GHS Seniors	45	40

I) Construct a 95% confidence interval of the difference in proportion of GHS seniors who went to the prom last year and NWHS seniors who went to the prom last year.

CHECK YOUR UNDERSTANDING

Your teacher brings two bags of colored goldfish crackers to class. She tells you that Bag 1 has 25% red crackers and Bag 2 has 35% red crackers. Each bag contains more than 500 crackers. Using a paper cup, your teacher takes an SRS of 50 crackers from Bag 1 and a separate SRS of 40 crackers from Bag 2. Let $\hat{p}_1 - \hat{p}_2$ be the difference in the sample proportions of red crackers.

1. What is the shape of the sampling distribution of $\hat{p}_1 - \hat{p}_2$? Why?
2. Find the mean and standard deviation of the sampling distribution. Show your work.
3. Find the probability that $\hat{p}_1 - \hat{p}_2$ is less than or equal to -0.02 . Show your work.
4. Based on your answer to Question 3, would you be surprised if the difference in the proportion of red crackers in the two samples was $\hat{p}_1 - \hat{p}_2 = -0.02$? Explain.