

# Motivational Posers

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# The Topic

Question of Interest

Does the presence of motivational posters in a classroom affect the grade of students in that classroom?

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# Why?

I chose to look at the effect of motivational posters because so many teachers hang them up on the walls, but do they actually help students learn?



# Data Collection

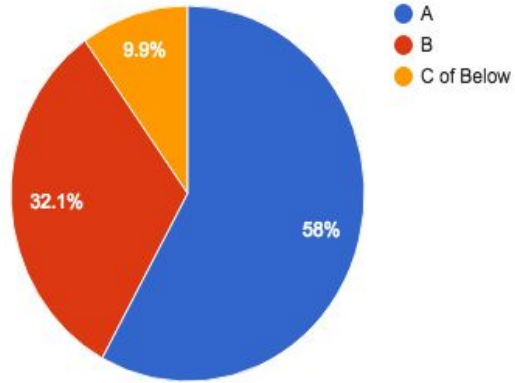
To collect data I decided to do a sample and survey students. To start I created a survey where I asked students the letter grade they received third quarter for the class they were in. To randomize the students I surveyed I randomly selected classes to go to. To randomly select I numbered classes (5th hour that were either core or a world language) from 1 to 30. Then on my calculator I used the random number generator to select ten classrooms. For each class I selected three numbers out of 1 through 9 to help me get a random selection in each classroom.

Observed	Motivational Posters Present		
	Yes	No	
Grade			
A	47	41	88
B	26	29	55
C of Below	8	11	19
	80	81	161

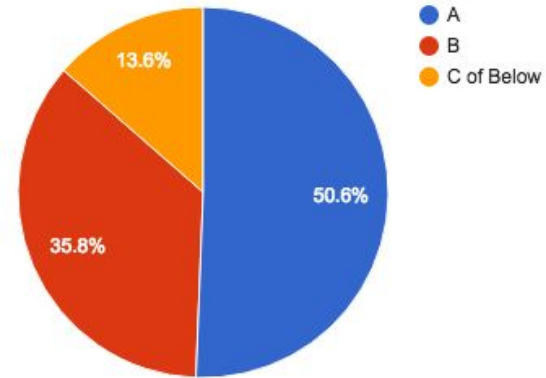
Expected	Motivational Posters Present		
	Yes	No	
Grade			
A	43.726	44.2732	88
B	27.329	27.671	55
C or Below	9.441	9.559	19
	80	81	161

Raw Data

**Poster Present**



**Poster Not Present**



Graph of Data

# Interpretation

There was about the same number of students in classes with and without motivational posters. There was a few more students with A's in classes with motivational posters and a few more with B's in classes without. For the most part the two groups were similar. The most common grade was A's, while C's and below were pretty rare.

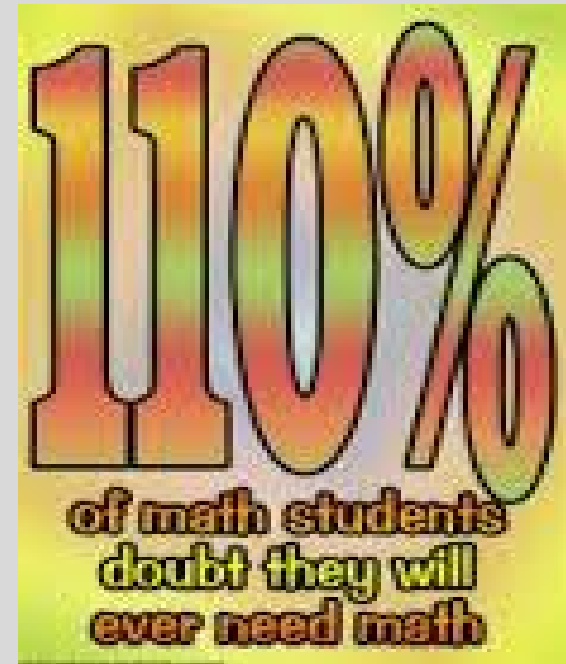
# Chi<sup>2</sup> Association Test

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# Parameters

We are interested in if there is an association between motivational posters and grades.



# Hypothesis

$H_0$ : There is no association between motivational posters and grades.

$H_a$ : There is an association between motivational posters and grades.

# Conditions

Random - Randomly selected sample

Large Counts - All expected values are greater than 5

Independent - 10% condition.  $161 \leq n \leq N$ . There are more than 1,620 grades given in a quarter.

# Test Statistic

$$\text{Chi}^2 = \sum (\text{Observed} - \text{Expected})^2 / \text{Expected}$$

$$(47 - 43.726)^2 / 43.726 + (41 - 44.273)^2 / 44.273 + \dots = 1.0464$$

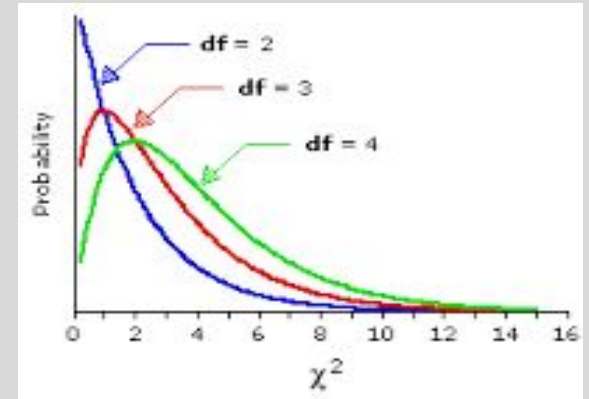
$$\text{Df} = (r-1)(c-1) = (2-1)(3-1) = 2$$

# P-Value

Step 1: Sketch the curve.

Step 2: Look up P-value or use the calculator

Use Chi<sup>2</sup> Test and use two matrix with the expected and observed values.



.59

The P-Value

# So Motivational Posters....

Because the P-value is not significant at the  $\alpha = .05$  level, we fail to reject the  $H_0$

There is not evidence that there is an association between the presence of motivational posters and grades in a given class.

# In Conclusion, What Could Have Changed?

Motivational posters seem to have no affect on students learning, positive or negative. While this is sad that teachers won't get boosted test scores when including them, it's good they won't hurt grades.

If an error happened it would've been a Type II. The motivational posters actually help or hurt learning, but we failed to reject the null hypothesis.

One problem is that the sample size was quite small, if I had more time I would've asked more students from different hours. This study is basically confined to fifth hour.

Another limitation is that many students might have lied about grades because of embarrassment or other factors. It would have helped to maybe get grades directly from teachers or a somehow more honest sample.