



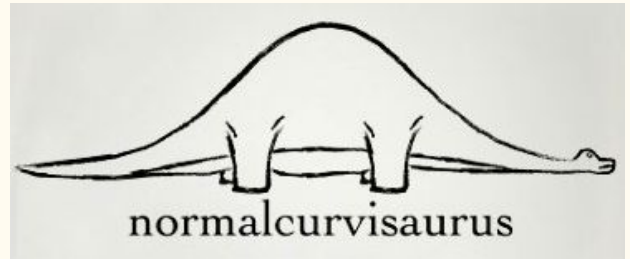
# Ilsa and Macy's Stats Project

...and Nick



# Project Overview

- For this project, we see who would speed through a yellow light and who would stop at a yellow light. We anonymously surveyed 70 Washburn students to get a general assumption of Washburn population as a whole. We believed that the results could vary based on your gender and how long the student has been driving.



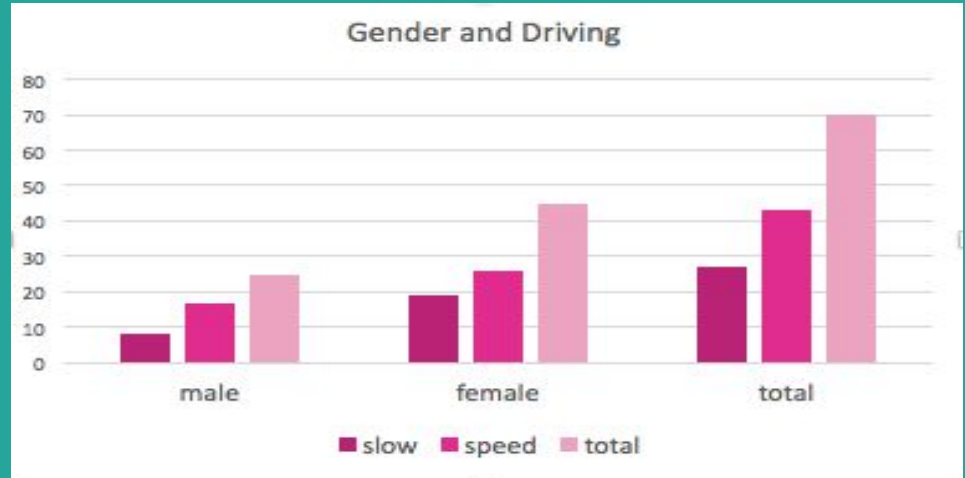
# Data Collection

- We numbered a master class list of Washburn classrooms in order then used a random digit table, selecting every 2 digits until we had 3 classrooms. We went to Mrs. Sunde, Mr. Gulliford and Ms. Kopple's room. We gave a total of 70 surveys to students at Washburn High. We made sure that all students in the classrooms filled out the survey.

# 1<sup>st</sup> Test of Association:

	male	female	total
slow	8	19	27
speed	17	26	43
total	25	45	70

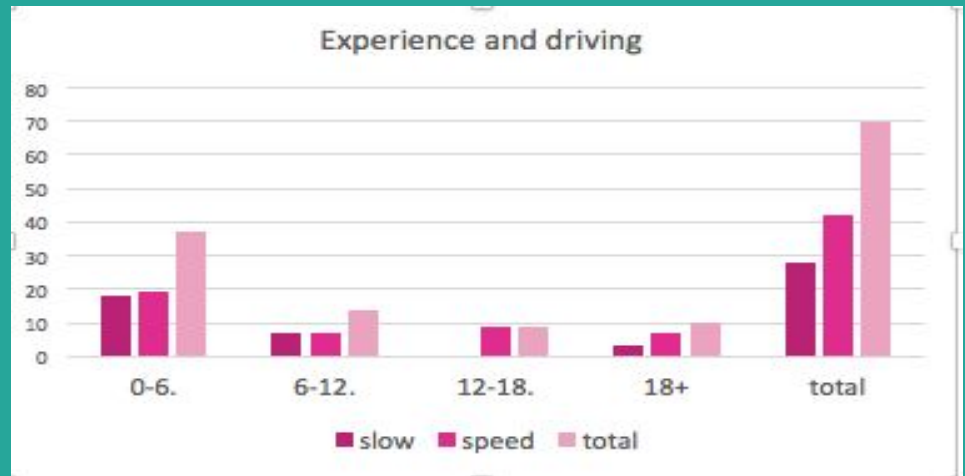
# Raw Data



## 2<sup>nd</sup> Test for Association:

# Raw Data

	0-6 mo.	6-12 mo.	12-18 mo.	18+ mo.	total
slow	18	7	0	3	28
speed	19	7	9	7	42
total	37	14	9	10	70



# First Test

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Gender and driving

# Chi Square Test for Association/ Independence

## Parameter:

We are interested in whether or not there is an association between a driver slowing down or speeding up at a yellow light and whether they are male or female.

## Hypotheses:

Ho: There is no association between slowing down or speeding up and gender of a driver.

Ha: There is an association between slowing down or speeding up and gender of a driver.

## Assumptions (Conditions):

Random : The sample was taken randomly by using the random digits table to determine which classrooms to survey by assigning each classroom with a two digit number.

Independent : 10% condition for the one sample. It is safe to assume there are at least 700 students at Washburn High School ( $n \leq 1/10 N$ ).

Large Counts Condition : All expected counts are least 5.

Name:

Chi Square Test for association/independence.

Test Statistic:

$$X^2 = \sum (O-E)^2/E \quad df = (r-1)(c-1)$$

$$X^2 = .70877 \quad df = 1$$

Obtain P-Value:

$$P = .39985$$

Make Decision:

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

State Conclusion in context:

There is not strong evidence that there is an association between the slowing down or speeding up and gender of a driver.



<i>Expected Values</i>	male	female	total
<b>slow</b>	9.642857143	17.35714286	27
<b>speed</b>	15.35714286	27.64285714	43
<b>total</b>	25	45	70



# Second Test

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*Driving experience and driving.*

## Chi Square Test for Association/Independence

### Parameter:

We are interested in whether or not there is an association between a driver slowing down or speeding up at a yellow light and how long they have been driving.

### Hypotheses:

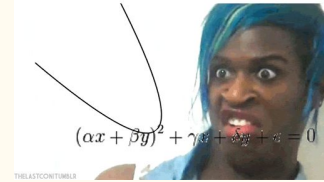
Ho: There is no association between slowing down or speeding up and how long they have been driving.

Ha: There is an association between slowing down or speeding up and how long they have been driving.

### Assumptions (Conditions):

These are the same for this test as the other.

\*Our expected counts were not all at least 5. This could lead to validity issues with our outcome but was the best we could do with the students available to us.\*



Name:

Chi Square Test for association/independence.

Test Statistic:

$$X^2 = \sum (O-E)^2/E \quad df = (r-1)(c-1)$$

$$X^2 = 8.153 \quad df = 3$$

Obtain P-Value:

$$P = .0429$$

Make Decision:

Because the P-Value is significant at the  $\alpha = .05$  level, we reject the null hypothesis.

State Conclusion in Context:

There is strong evidence that there is an association between the slowing down or speeding up and years of driving experience.

<i>Expected Counts</i>	<b>0-6 mo.</b>	<b>6-12 mo.</b>	<b>12-18 mo.</b>	<b>18+ mo.</b>	<b>total</b>
<b>slow</b>	14.8	5.6	3.6	4	28
<b>speed</b>	22.2	8.4	5.4	6	42
<b>total</b>	37	14	9	10	70

# Conclusion

- In conclusion, we see that there is no association between gender and whether or not a driver will run a yellow light. However, we did see that there is an association between how long drivers have had their driver's license and whether or not they will run a yellow light.
- If we were to take more tests on the same subject, we would take a test to show *how much* of an association there is between the speeding or slowing at a yellow light based on how long the student has had their driver's license.

# Potential Problems

- We only went to three classrooms, which may of affected our data
- Macy and Ilsa were my partners
- A lot of the people that we tested didn't have their driver's license yet
- Nick can't do math or spell
- Not all of our expected values for our second test were at least 5

The End

