

## CHI-SQUARE TEST FOR HOMOGENEITY OF POPULATIONS

*This test is used to determine if a single categorical variable has the same distribution in 2 (or more) distinct populations from 2 (or more) samples.*

To determine if there was an association between race and opinions about schools, researchers surveyed 3 randomly selected groups of parents and asked them “Are high schools in your state doing an excellent, good, fair or poor job or don’t you know enough to say?”.

	<b>Black Parents</b>	<b>Hispanic Parents</b>	<b>White Parents</b>	<b>TOTAL</b>
<b>Excellent</b>	12	34	22	<b>68</b>
<b>Good</b>	69	55	81	<b>205</b>
<b>Fair</b>	75	61	60	<b>196</b>
<b>Poor</b>	24	24	24	<b>72</b>
<b>Don’t Know</b>	22	28	14	<b>64</b>
<b>TOTAL</b>	<b>202</b>	<b>202</b>	<b>201</b>	<b>605</b>

### DETERMINE EXPECTED COUNTS:

Expected Count = (Row Total)(Column Total)/ Sample Size

	<b>Black Parents</b>		<b>Hispanic Parents</b>		<b>White Parents</b>	
	Actual	Expected	Actual	Expected	Actual	Expected
<b>Excellent</b>	12		34		22	
<b>Good</b>	69		55		81	
<b>Fair</b>	75		61		60	
<b>Poor</b>	24		24		24	
<b>Don’t Know</b>	22		28		14	

## H STATE NULL AND ALTERNATIVE HYPOTHESES

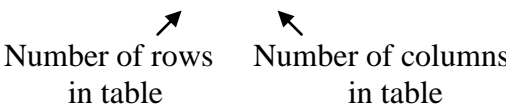
### A DETERMINE THAT CONDITIONS FOR TEST ARE ACCEPTABLE:

- Random
- Every expected count  $\geq 5$
- Independent

## **T PERFORM TEST USING...**

### **FORMULA/TABLE C:**

a) Chi-Square Statistic:  $X^2 = \sum (O_i - E_i)^2 / E_i =$

b) Degrees of Freedom =  $(r - 1)(c - 1) =$   
  
Number of rows in table      Number of columns in table

c) *P*-Value

i) Table C

ii) Calculator:

### **CALCULATOR:**

a) Store observed counts in a [R,C] matrix:

b) Perform  $X^2$  Test:

### **NOTE:**

## **S STATE CONCLUSION IN CONTEXT:**