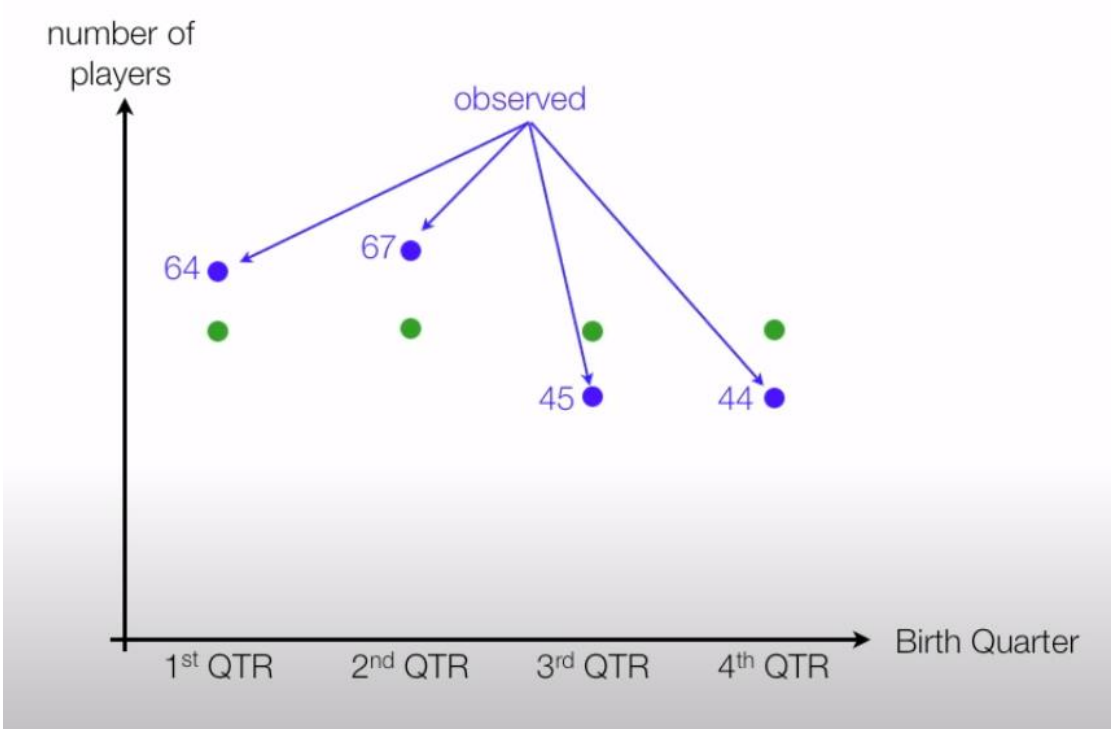
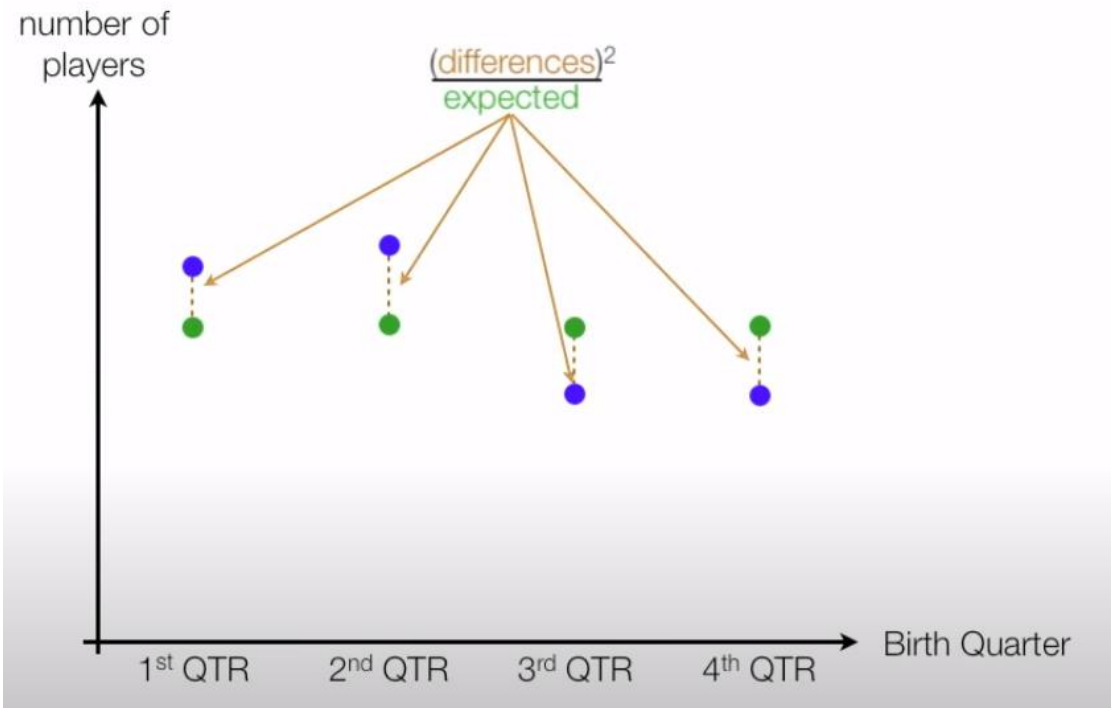
Ho: Birth month has no impact on a child growing up to become a NHL hockey player

95% confidence $\alpha = .05$





	1st QTR	2nd QTR	3rd QTR	4th QTR	
Observed	64	67	45	44	
- Expected	55	55	55	55	
Differences	9	12	-10	-11	
$\frac{(\text{Differences})^2}{\text{Expected}}$	$\frac{81}{55}$	$\frac{144}{55}$	$\frac{100}{55}$	$\frac{121}{55}$	
	1.5	2.6	1.8	2.2	$8.1 = \chi^2$

$$\text{chi - square} = \chi^2 = \sum \frac{(O - E)^2}{E} = 8.1$$

Categories

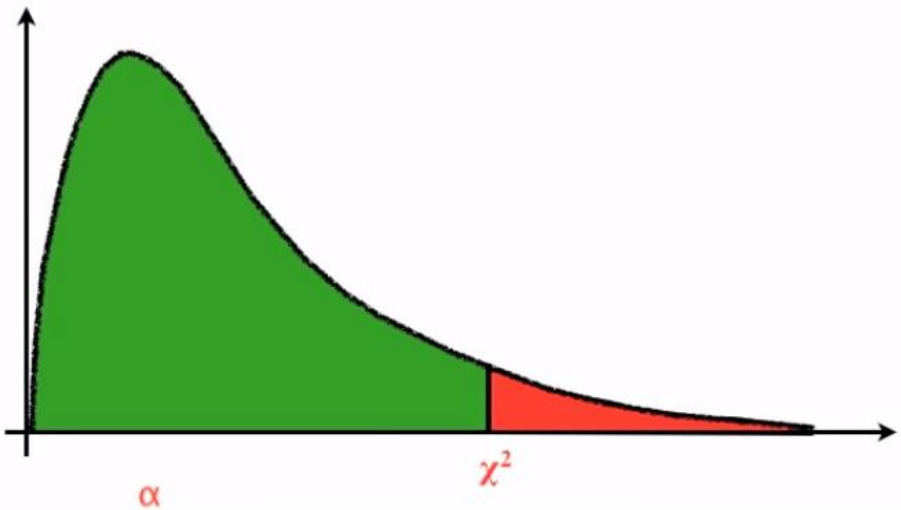
1	2	3	4
1st QTR	2nd QTR	3rd QTR	4th QTR

degrees of freedom = C - 1

d.f. = 4 - 1 = 3

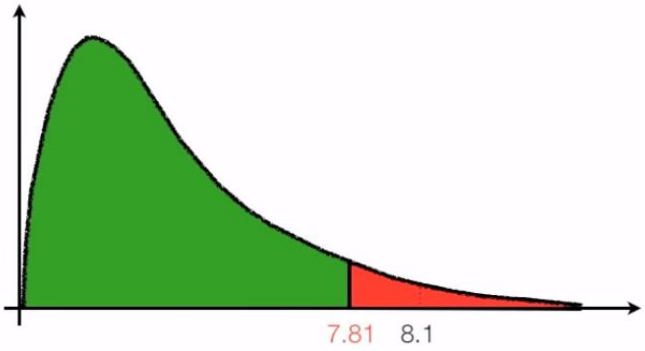
$8.1 = \chi^2$

d.f. = 3 $8.1 = \chi^2$ $\alpha = .05$



d.f.	α .10	.05	.01
1	2.71	3.84	6.63
2	4.61	5.99	9.21
3	6.25	7.81	11.34
4	7.78	9.49	13.28
⋮			
100			

d.f. = 3 $8.1 = \chi^2$ $\alpha = .05$



REJECTED

Ho: Birth month has no impact on a boy growing up to become a NHL hockey player

Ho: Self Esteem has no impact on academic performance

95% confidence $\alpha = .05$

Self Esteem

Academic Performance	High	Medium	Low
High	21	31	8
Low	12	43	35

Self Esteem

Academic Performance	High	Medium	Low
High	21	31	8
Expected			

Self Esteem

	High	Medium	Low
Low	12	43	35
Expected			

Expected Self Esteem

High	Medium	Low
20%	50%	30%

Self Esteem

High Academic Performance	High	Medium	Low
Observed	21	31	8

Expected 12 + 30 + 18 = 60

Self Esteem

Low Academic Performance	High	Medium	Low
Observed	12	43	35

Expected 18 + 45 + 27 = 90

60 + 90 = 150

Self Esteem

High Academic Performance	High	Medium	Low
Observed	21	31	8
Expected	12	30	18
Difference	9	1	-10
$\frac{(\text{Difference})^2}{\text{Expected}}$	$\frac{81}{12}$	$\frac{1}{30}$	$\frac{100}{18}$
	6.75	0.03	5.56

Self Esteem

Low	High	Medium	Low
Observed	12	43	35
Expected	18	45	27
	-6	-2	8
	$\frac{36}{18}$	$\frac{4}{45}$	$\frac{64}{27}$
	2.00	0.09	2.37

chi - square = χ^2 = 16.8 = $\sum^{\text{sum}} \frac{(O-E)^2}{E}$

Self Esteem

Categories

Academic Performance	1 High	2 Medium	3 Low	
High	21	31	8	1
Low	12	43	35	2

Rows

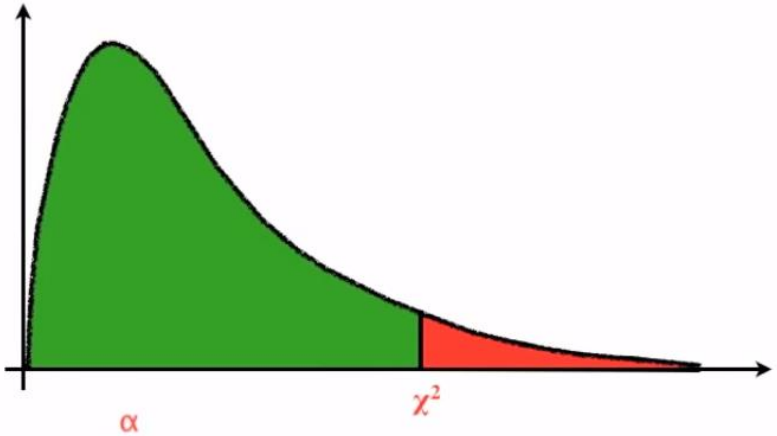
degrees of freedom = (R - 1)(C - 1)

d.f. = (2 - 1)(3 - 1)

d.f. = (1)(2)

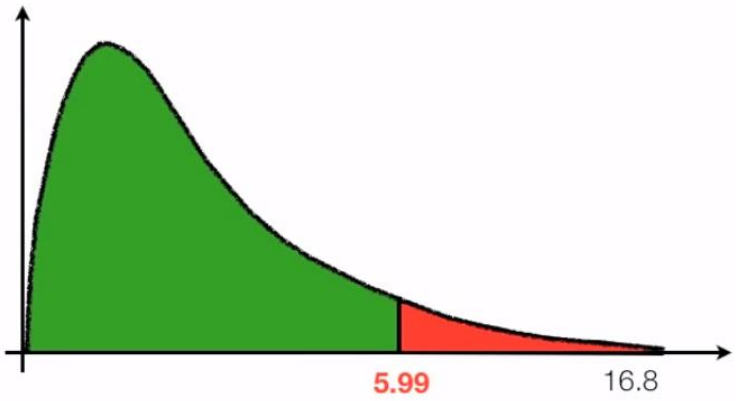
d.f. = 2 $\chi^2 = 16.8$

d.f. = 2 $\chi^2 = 16.8$ $\alpha = .05$



d.f.	α .10	.05	.01
1	2.71	3.84	6.63
2	4.61	**5.99**	9.21
3	6.25	7.81	11.34
4	7.78	9.49	13.28
⋮			
100			

d.f. = 2 χ^2= 16.8 α = .05



REJECTED

Ho: Self Esteem has no impact on academic performance

χ^2 (2, n = 150) = 16.8, p < .05