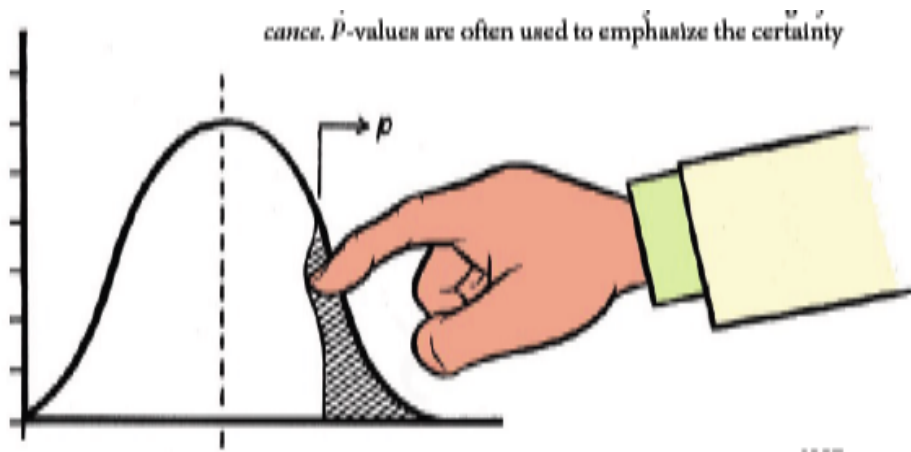


Mendel Revisited: Phenotypic Distribution of F2 hermaphrodites

Initials		WT	UNC	DPY	Unc Dpy	n	χ^2	p
	Expected ratio	9	3	3	1			
JY	Raw data	50	20	8	3	81	6.216	.01-.025
	<i>Observed Ratio*</i>				1			
KH	Raw data	75.3	12.3	14	6.3	108	8.565	.025-.05
	<i>Observed Ratio</i>	11.9	2.0	2.2	1			
KA H	Raw data	90	28.58	44	7	169.5	6.540	0.02-.01
	<i>Observed Ratio</i>	12.86	4.07	6.29	1			
IO	Raw data	77	16	19	7	119	3.816	0.115
	<i>Observed Ratio</i>	11	2.3	2.7	1			
TCD	Raw data	44	15	16	5	80	0.089	0.99-.97
	<i>Observed Ratio</i>	8.8	3	3.2	1			
MO	Raw data	93	27	19	7	146	4.5	0.98-0.2
	<i>Observed Ratio</i>	13.3	3.9	2.7	1			
JRB	Raw data	74	20	24	3	118	3.849	0.98-0.2
	<i>Observed Ratio</i>	24.7	6.7	8	1			
BK	Raw data	76.5	9.5	25.5	3.5	115	38.737	<0.001
	<i>Observed Ratio</i>	21.9	2.7	7.3	1			
GP	Raw data	69.5	11	15.5	2.5	98.5	9.240	.05-.025
	<i>Observed Ratio</i>	27.8	4.4	6.2	1			
NB	Raw data	99.5	22	25	10.5	157	3.992	0.288
	<i>Observed Ratio</i>	9.4	2.1	2.4	1			
RK	Raw data	65	11	15	5	96	5.627	0.14
	<i>Observed Ratio</i>	13	2.2	3	1			
KS	Raw data	39	17.7	14	10	80	6.2489	0.10
	<i>Observed Ratio</i>	3.9	1.77	1.4	1			
WF	Raw data	100	17	20	6	143	10.978	.012
	<i>Observed Ratio</i>	16.7	2.8	3.3	1			
AG	Raw data	102	31	34	8.5	175.5	1.453	0.693
	<i>Observed Ratio</i>	12	3.6	4	1			
GL K	Raw data	65	15	19	2	101	4.12	>0.1
	<i>Observed Ratio</i>	32.5	7.5	9.5	1			
KB	Raw data							
	<i>Observed Ratio</i>				1			



How do I determine if a particular p -value is significant?

*If p is large, the **observed deviation** from the expected results is considered **insignificant**.*

*If the probability is very low (<0.05) the **observed deviation** from the expected results becomes **significant**.*

What does significant mean?

- *In statistics, a result is called statistically significant if it is unlikely to have occurred by chance*
- *The amount of evidence required to accept that an event is unlikely to have arisen by chance is known as the significance level or critical p -value: in traditional frequentist statistical hypothesis testing, the p -value is the frequency or probability with which the observed event would occur, if the null hypothesis were true.*
- *If the obtained p -value is smaller than the significance level, then the null hypothesis is rejected -- well, **MAYBE***

The chi square test assists the investigator in accepting or rejecting a hypothesis by calculating the probability that the data are compatible with the hypothesis

It can not be emphasized too strongly that any test of goodness-of-fit can only assist an investigator in making up his/her mind.

Interpreting the results of a chi square analysis

p value > 0.05

- *Your hypothesis may be correct and any differences between O and E due to chance.*
- *On the other hand, a p value > 0.05 Does NOT prove your hypothesis as competing hypotheses may also have a p value that is > 0.05.....*

p value < 0.05

- *Your hypothesis may be incorrect. The difference between E & O is not due to chance but due to an incorrect hypothesis. If we decide to reject the hypothesis based on the chi square analysis, what do we do or ask next?*
- *On the other hand, a p value < 0.05 does NOT disprove your hypothesis. Your hypothesis may be correct and something else is going that results in a difference between O and E is not due to just to chance. We're not going to throw out our hypothesis just yet but:*

What should you do next?

Where would you go from here to resolve the problems? What could that something else be?