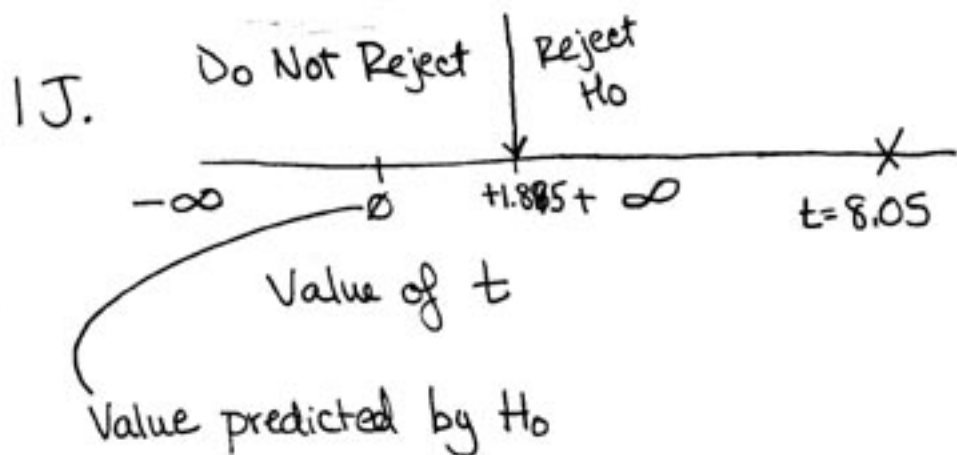


- 1 A) The scientific hypothesis is that the MSIT program will significantly raise the test scores of junior high school kids. The PCH of chance is that any difference in test scores after the program will just be a chance difference.
- 1 B) The scientific hypothesis is directional because it predicts that the mean test score will be significantly higher after the program. If it was non-directional it would only predict that the post-program^m mean test score would be significantly different from the before-program mean test score.
- 1 C) t-correlated
- 1 D) $H_0: E(M_D) = 0$
 $H_1: E(M_D) > 0$
- 1 E) $\alpha < .05$ OR $p < .05$
- 1 F) The ^{acceptable} probability level that the observed difference is due to sampling error or chance.

IG. $DF = N - 1 = 8 - 1 = \textcircled{7}$

IH. H_1 is a one-tailed test. The scientific hypothesis predicts higher scores so we can put the critical value (and all 5% of alpha) on one side or in one tail of the distribution.

II. 1.895



IK. Yes, the data pattern favors the scientific hypothesis. Scores are higher after the program than before

(see next page)
→

1L. Calculate t

FINAL
Form 2 (3)
Psych 3000
Summer 2000

	1	2	3	4	5	6	7	8
Student	A	B	C	D	E	F	G	H
After	67	91	142	77	66	150	105	89
Before	64	89	139	70	62	144	98	84

Difference (d)	3	2	3	7	4	6	7	5	Sum of Row	37
Squared Difference (d ²)	9	4	9	49	16	36	49	25	Sum of Row	197

Mean Difference (Md) $37/8 = 4.625$

Σd 37

Σd^2 197

Sd 1.7985

$$Sd = \sqrt{\frac{\Sigma d^2}{Nd} - (Md)^2}$$

$$= \sqrt{\frac{197}{8} - (4.625)^2} = \sqrt{24.625 - 21.3906}$$

$$= \sqrt{3.2348} = 1.7984$$

$$t = \frac{Md}{Sd / \sqrt{Nd - 1}} = \frac{4.625}{1.7984 / \sqrt{8 - 1}} = \frac{4.625}{1.7984 / 2.6458}$$

$$= \frac{4.625}{.6797} = 6.804$$

1M. ^{Calculated} Value of t is greater than
the critical value of t of 1.895.

So calculated t (8.05) falls into the rejection
region. So I reject H_0 & conclude that
the MSIT significantly improves the algebra
test scores of junior high students.

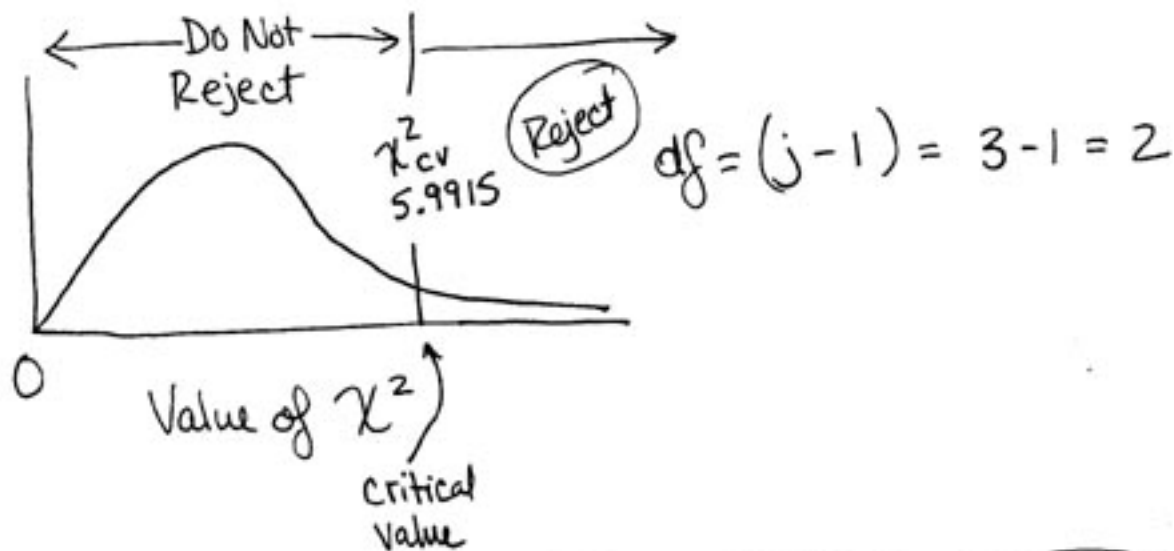
1N. This study has statistical conclusion validity
because our calculated test statistic has a less
than 5% chance of being due to chance
alone

2A. Yes, if there are 30% small dogs, 50% medium
dogs, & 20% large dogs in the national sample,
and the Park City sample is 20% small dogs,
50% medium dogs, and 35% large dogs \rightarrow
then the Park City sample has fewer small dogs
and more large dogs.

2B - Chi-square goodness of fit.

2C - $H_0: E(\chi^2) = 0$
 $H_1: E(\chi^2) > 0$

2D. Choose $\alpha = .05$



2E.

	LARGE	MEDIUM	SMALL
frequency observed (f_o)	70	90	40
frequency expected (f_e)	$.2(200) = 40$	$.5(200) = 100$	$.3(200) = 60$
$f_o - f_e$	70-40	90-100	40-60

$$\chi^2 = \frac{(f_o - f_e)^2}{f_e} = \frac{(70-40)^2}{40} + \frac{(90-100)^2}{100} + \frac{(40-60)^2}{60}$$

$$\chi^2 = \frac{(30)^2}{40} + \frac{(-10)^2}{100} + \frac{(-20)^2}{60} = \frac{900}{40} + \frac{100}{100} + \frac{400}{60}$$

$$= 22.5 + 1 + 6.6667 = 30.17$$

2F. I reject H_0 because the calculated value of χ^2 (30.17) falls in the rejection region, past the critical value of 5.992.