

Controversial Correlation

Null Hypothesis:

There is no correlation or relationship between ice cream production and the incident of violent crime.

Alternative Hypothesis:

There is a correlation or a relationship between ice cream production and the incident of violent crime.

Null Hypothesis:

$$H_0: r_{XY} = 0$$

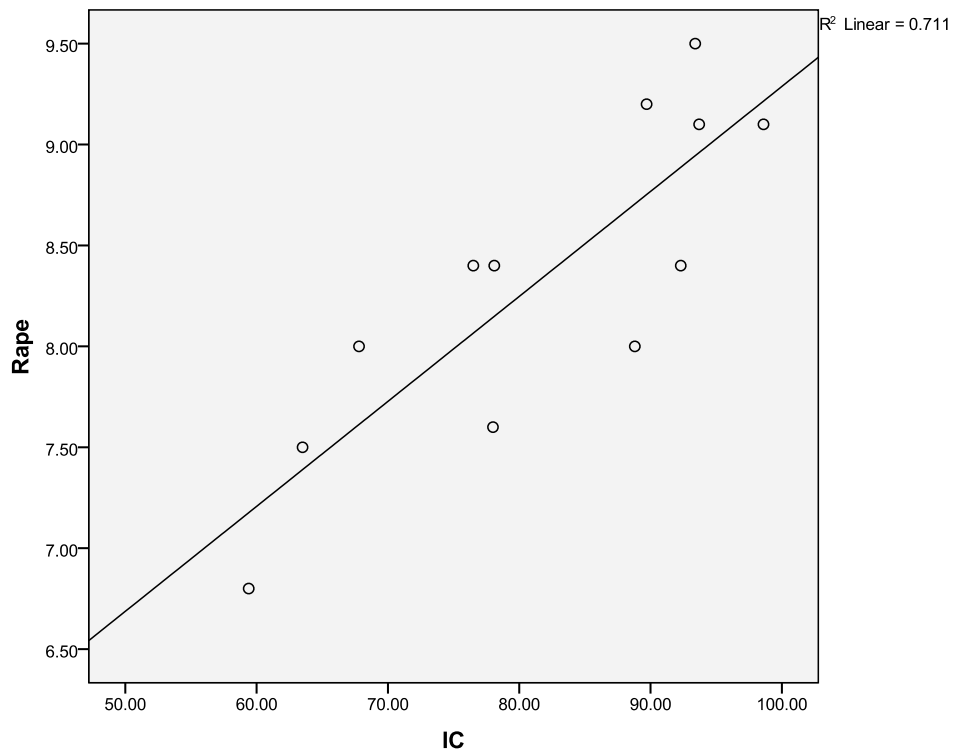
Alternative Hypothesis:

$$H_1: r_{XY} \neq 0$$

		IC	Rape
IC	Pearson Correlation	1	.843**
	Sig. (2-tailed)		.001
	N	12	12
Rape	Pearson Correlation	.843**	1
	Sig. (2-tailed)	.001	
	N	12	12

** . Correlation is significant at the 0.01 level (2-tailed).

Scatter Plot Regression Line



Correlation Coefficient (r) = .843

Direction of the Correlation: The potential relationships between variables positive as the direction of the scatter plot is moving upward from left to right.

Strength of Correlation: The relationship between variables (ice cream production and the incident of violent crime) would be very strong.

Coefficient of Determination: .711

Coefficient of Alienation: .299

71.1% of the relationship is explained between variables and 29.9% is left unexplained or by factors not controlled by the researcher.

Degrees of Freedom: $df = N - K$ where $N = \#$ of observations and $K = \#$ of parameters to be estimated

$df = 12 - 2$

$df = 10$

Test Statistic:

$$t = \frac{r_{XY}}{\sqrt{\frac{1 - (r_{XY})^2}{N - 2}}}$$

t= 4.959

Comparison: Estimated t-statistic to the critical t

df= 10

Significance=. 001

4.959 > 4.587

Because the t statistic is greater than critical t, we reject the H_0 (There is no correlation or relationship between ice cream production and the incident of violent crime) with 99% confidence.

Conclusion:

Based on the statistics we were given, yes there is a meaningful connection between how much ice cream is consumed in America and how often rape (violent crime) occurs. And although our data suggests that we are not at risk of committing a Type 1 Error, our disregard of a key component concept qualifies the relationship of this concept of time of year (weather).