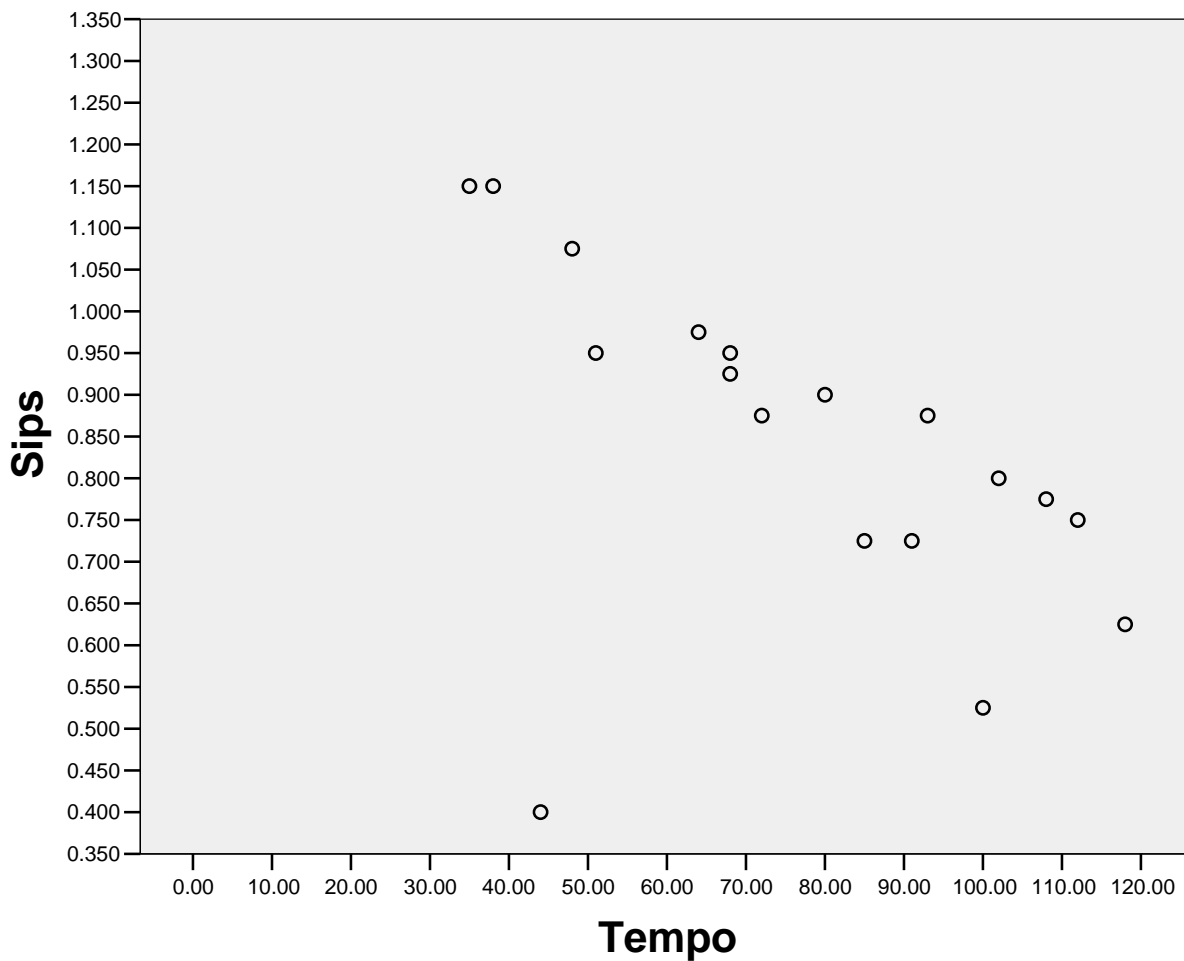


## Guessing the Correlation/Predicting Outcomes

Bach, P. & Schaefer, J. M. (1979). The tempo of country music and the rate of drinking in bars, *Journal of Studies on Alcohol*, 40, 1058 – 1059.

Patron	Tempo	Sips	Patron	Tempo	Sips	Patron	Tempo	Sips	Patron	Tempo	Sips
1.00	35.00	1.150	6.00	64.00	.975	11.00	85.00	.725	16.00	108.00	.775
2.00	38.00	1.150	7.00	68.00	.950	12.00	91.00	.725	17.00	112.00	.750
3.00	44.00	0.400	8.00	68.00	.925	13.00	93.00	.875	18.00	118.00	.625
4.00	48.00	1.075	9.00	72.00	.875	14.00	100.00	.525			
5.00	51.00	0.950	10.00	80.00	.900	15.00	102.00	.800			



Name of Data file: tempo and alcohol - Bach and James, 1979.sav

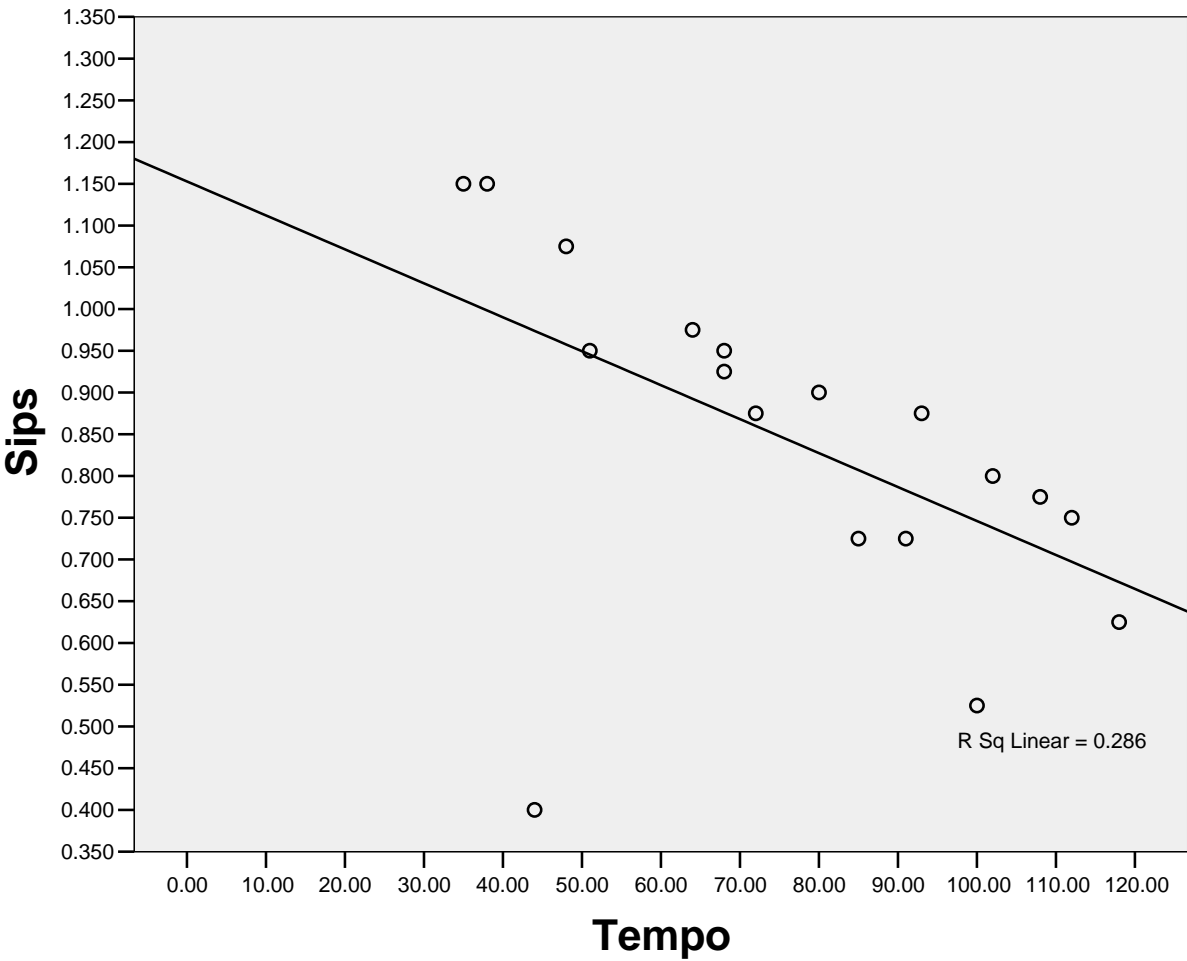
Name of Syntax file: tempo and alcohol - Bach and James, 1979.sps



**Questions:**

1. Identify the kind, or direction, of a relationship if one appears to exist:  
Guessed Direction: \_\_\_\_\_ Actual Direction (Pearson's  $r$ ): \_\_\_\_\_
2. Guess the  $r$  value: Your Estimate: \_\_\_\_\_ Actual (Pearson's  $r$ ): \_\_\_\_\_
3. Using a straight edge and a pencil, draw a "dotted line" that would best illustrate the direction of the relationship between tempo and sips. Place a number "1" next to the ends of this line so that you can distinguish it from the other lines.
4. Predict how many sips (Y) one would take if the tempo (X) = 0. Plot a dot for this XY pair and label it "A". Predicted Sips: \_\_\_\_\_ Actual (predicted using regression): \_\_\_\_\_
5. Predict how many sips (Y) one would take if the tempo (X) was 60. Plot a dot for this XY pair and label it "B". Predicted Sips: \_\_\_\_\_ Actual (predicted using regression): \_\_\_\_\_
6. Draw another "dotted line" that connects the dots you just created for tempo = 0 and tempo = 60 (connecting letters **A & B**). Place a number "2" next to the ends of this line.
7. Predict how many sips one would take if the tempo was 76.5 (the mean tempo):  
Predicted Sips: \_\_\_\_\_ Actual (predicted using regression): \_\_\_\_\_
8. Plot a dot for the XY pair, tempo (X) = 76.5; sips (Y) = .8417 and label it "C". These are the means for tempo and sips. This XY point represents the **centroid**.
9. Draw another "dotted line" that connects the dot for tempo = 0 and dot for the means of X and Y (tempo (X) = 76.5; sips (Y) = .8417) (connect Letters **A & C**). Place a number "3" next to the ends of this line. (Additional practice: Use SPSS to calculate the means and the correlation)
10. **Figure B:** Regression equation:  $\hat{Y} = (b_0 + b_1X)$ ; Using SPSS, you will find:  
 $b_0$  (unstandardized regression constant/y-intercept) = 1.153  
 $b_1$  (slope; unstandardized coefficient) = -.004  
 For the number of sips, when tempo (X) = 0,  
 $\hat{Y} = 1.153 + (-.004)(0) = 1.153$   
*Note:* This is the actual predicted value for Question 4 (see above)
11. **Figure C:** Regression equation:  $\hat{Y} = (b_0 + b_1X)$ ; Using SPSS, you will find:  
 For the number of sips, when tempo (X) = 76.5,  
 $\hat{Y} = 1.153 + (-.004)(76.5)$ ; note, X = mean tempo of music  
 $\hat{Y} = 1.153 + (-.306) = .84$ ; note, Y = mean number of sips  
*Note:* This is the actual predicted value for Question 7 (see above)
12. **Figure D:** Predict sips when tempo is 60:  $\hat{Y} = (b_0 + b_1X)$   
 For the number of sips, when tempo (X) = 60,  
 $\hat{Y} = 1.153 + (-.004)(60)$   
 $\hat{Y} = 1.153 + (-.24) = .913$   
*Note:* This is the actual predicted value for Question 5 (see above)

Figure A – The Scatterplot with the Regression Line (Line of Best Fit)



*Note:* Adding the line-of-best fit, the regression line, also adds the  $r^2$  . Taking the square root will give you the Pearson's  $r$  correlation coefficient.

Figure B

For the number of sips, when *tempo* ( $X$ ) = 0, *sips* ( $Y$ ) = 1.153 (y-intercept, when the regression line intercepts the Y axis).

Note: SPSS might not be display its default plots in a very clear fashion (see below).

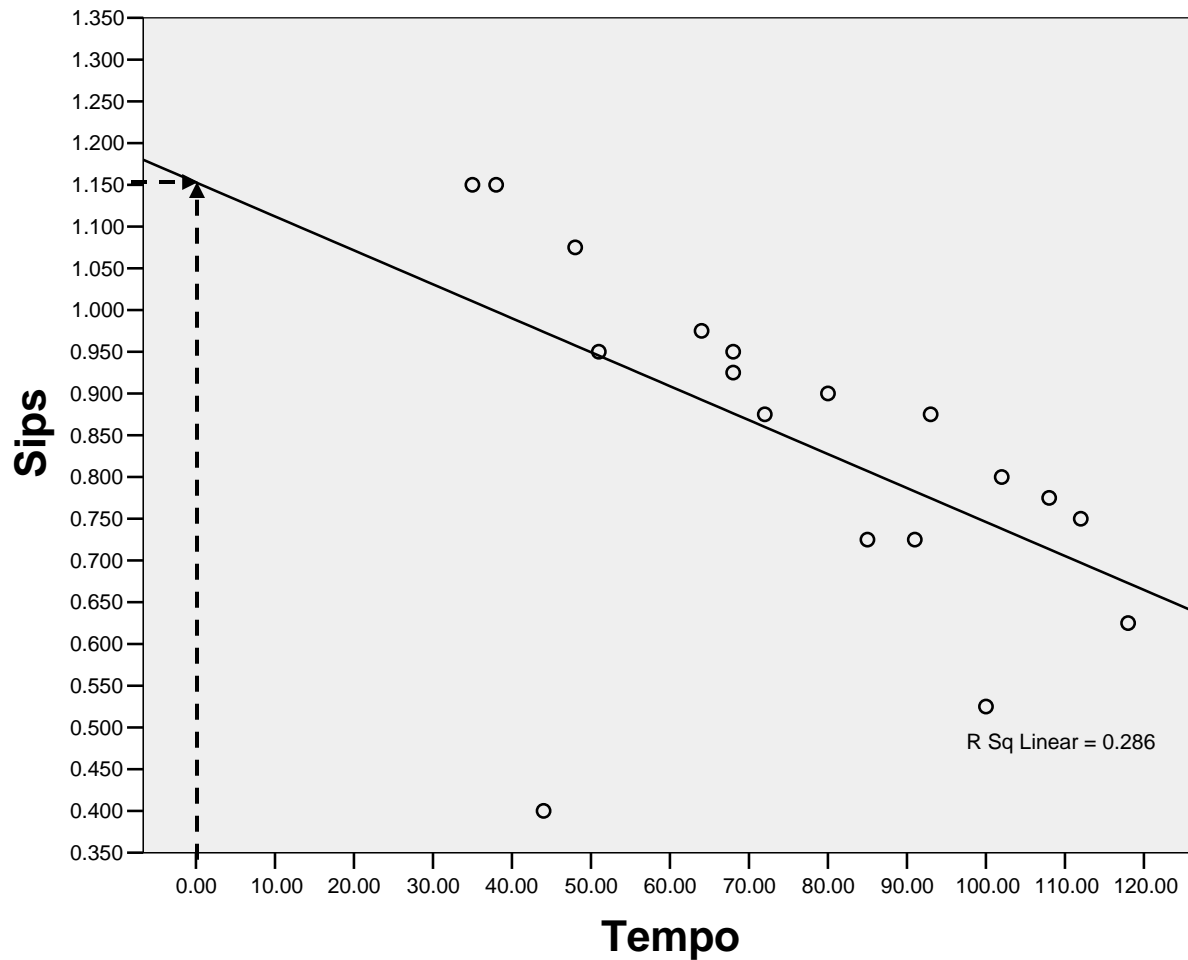


Figure C

For the number of sips, when *tempo* ( $X$ ) = 76.5, *sips* ( $Y$ ) = .84 (the centroid represents the XY pair corresponding to  $X$  and  $Y$  means)

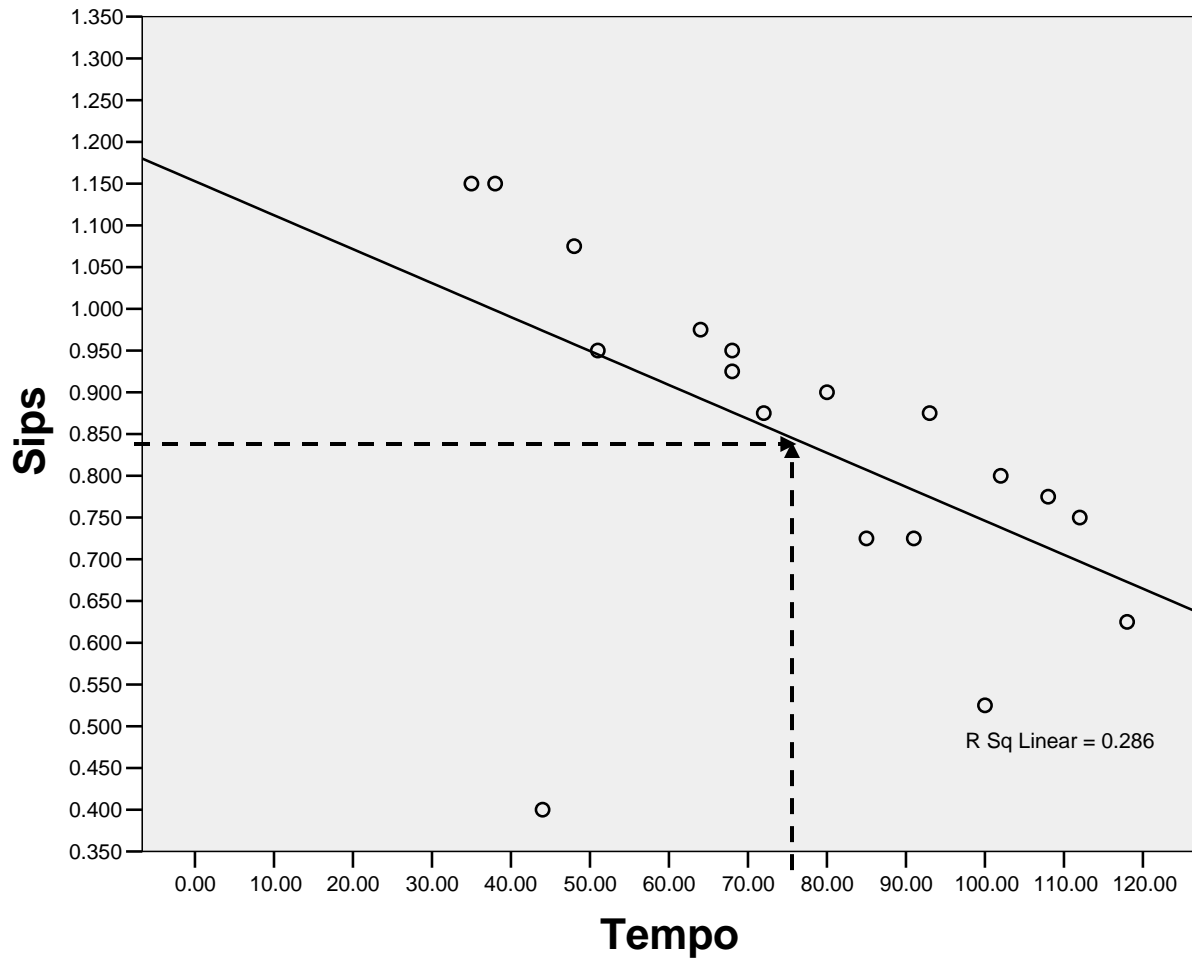


Figure D

