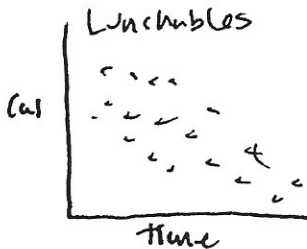


Does how long young children remain at the lunch table help predict how much they eat? Here are data on 20 toddlers observed over several months at a nursery school. "Time" is the average number of minutes a child spent at the table when lunch was served. "Calories" is the average number of calories the child consumed during lunch, calculated from careful observation of what the child ate each day.

Time	21.4	30.8	37.7	33.5	32.8	39.5	22.8	34.1	33.9	43.8
Calories	472	498	465	456	423	437	508	431	479	454
Time	42.4	43.1	29.2	31.3	28.6	32.9	30.6	35.1	33.0	43.7
Calories	450	410	504	437	489	436	480	439	444	408

1. Describe the relationship in a graph and by regression analysis.

The association appears to be moderate, negative, linear, with no obvious outliers. A residual plot shows random scatter indicating a linear model is appropriate.



$$\text{Calories} = 560.6513 - 3.0771 \text{ Time}$$

$$r = -.6492$$

$$r^2 = .4214$$

About 42% of the variation in calories can be explained by the least squares regression of calories on time.

2. Perform a test of significance for these data. Use the back of this sheet if you need more space.

$$t = b / SE_b$$

$$= -3.0771 / .8498$$

$$t = -3.6208$$

$$df = 18$$

$$p\text{-value} = .001954$$



If H_0 were true, we'd get sample results like this less than 1% of the time by chance variation. So, we reject H_0 . We have evidence to believe that time at the table is useful in predicting calories consumed.

3. Construct a 90% confidence interval to estimate how rapidly calories consumed changes as time at the table increases.

$$\text{est} \pm \text{m.o.e}$$

$$b \pm t^* SE_b$$

$$-3.0771 \pm (1.734)(.8498)$$

$$(-4.5507, -1.6035)$$

We are 90% confident that the true slope of the regression of calories consumed on time at the table is between -4.5507 and -1.6035 calories per time.

