

We often describe our emotional reaction to social rejection as “pain.” A clever study asked whether social rejection causes activity in areas of the brain that are known to be activated by physical pain. If it does, we really do experience social and physical pain in similar ways. Subjects were first included and then deliberately excluded from a social activity while changes in brain activity were measured. After each activity, the subjects filled out questionnaires that assessed how excluded they felt. The table below shows data for 13 subjects.

The explanatory variable is “social distress” measured by each subject’s questionnaire score after exclusion relative to the score after inclusion. (So values greater than 1 show the degree of distress caused by exclusion.) The response variable is change in activity in a region of the brain that is activated by physical pain.

Subject	Social distress	Brain activity	Subject	Social distress	Brain activity
1	1.26	-0.055	8	2.18	0.025
2	1.85	-0.040	9	2.58	0.027
3	1.10	-0.026	10	2.75	0.033
4	2.50	-0.017	11	2.75	0.064
5	2.17	-0.017	12	3.33	0.077
6	2.67	0.017	13	3.65	0.124
7	2.01	0.021			

- Use your calculator to construct a scatterplot of these data. Describe what you see.
- Find the equation of the least-squares line on your calculator. Record the equation below. Be sure to define any variables used.
- Interpret the slope of the least-squares line in context.
- Show how to calculate the residual for the individual with social distress score 2.01.
- What would you predict for the brain activity level for an individual with social distress 3.10?
- Interpret the value of r^2 from your calculator in the context of this problem.