

Demo: Using the Prediction Profiler

In this video, we use the Impurity example and fit a model for the response, Impurity, with three predictors, Temp, Catalyst Conc, and Reaction Time. Then we use the Prediction Profiler to better understand the model coefficients.

Let's begin by selecting Fit Model from the Analyze menu.

We'll select Impurity as the Y variable.

Then we'll select Temp, Catalyst Conc, and Reaction Time as the model effects and select Run.

Recall that the Parameter Estimates table reports the coefficients for the terms in the model. To better understand these coefficients, we'll use the Prediction Profiler.

To turn on the Prediction Profiler, we use the top red triangle and select Factor Profiling and Profiler.

The profiler shows the predicted response (on the far left) at specified values of each of the predictor variables, which are listed across the bottom.

The initial values for the predictors are the averages, and the starting value for the response is the overall average of Impurity.

The bracketed values represent the 95% confidence interval for the average of Impurity at the values of the predictors.

The slopes of the lines for each predictor reflect the model coefficients.

For both Temp and Catalyst Conc, the slopes are positive, indicating that as we increase values of either variable, the predicted value of Impurity increases.

What about Reaction Time? Notice that the slope of the line is flat, reflecting that the coefficient for Reaction Time is not significant.

As we change the value of Reaction Time, holding the other variables constant, the change in the predicted value of Impurity is not significant.

We can interact with the profiler by moving the vertical red lines for each predictor. This is equivalent to plugging the value for a predictor into the regression equation. The lines start at the mean of each predictor.

When we drag Temp to the lowest value, the predicted value of Impurity drops to 4.93%.

When we also drag Catalyst Conc to its lowest level, the predicted value of Impurity again drops. Now the predicted value is 3.43%.

Recall that the average of Impurity for our sample is 6.12%. The goal is to bring this to 3%. If we could lower the average of Impurity to 3.43%, it would be a great improvement!

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