
Subject: Re: Compare non-linear function fit parameters of two data sets

Posted by [Russell\[1\]](#) on Mon, 23 Nov 2015 20:06:00 GMT

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On Sunday, November 15, 2015 at 5:21:22 AM UTC-5, suruchi wrote:

> If we have two different sample datasets and we fit a non-linear function to these two datasets (for example an exponential function $AB^x + C$), then how do we compare the two fits?

As a general rule, χ^2 is probably what you want. But the problem can be a bit more subtle, if you're not careful. If you're fitting two different models to a bunch of data and trying to conclude which model is better, then χ^2 might not be the whole story. If the models have different numbers of free parameters, then χ^2 can be deceiving. Consider a case where you have a model of the form:

$$y(x) = a + b * x$$

and a second model:

$$z(x) = a + b*x + c*x^2 + d*x^3 + \dots + h*x^6$$

then you naturally expect $z(x)$ to be a better fit (and lower χ^2) by virtue of having more "flexibility". Look at the various "information criteria":

https://en.wikipedia.org/wiki/Information_criterion

But even this isn't very clear, because the question of model selection is not entirely closed (at least that is my understanding).

-R
