**Supporting information**

**S1 Appendix. Mathematical derivation demonstrating the relationship between linear regression and autocorrelation approaches.**

The linear regression and autocorrelation approaches to measuring motor adaptation are closely related as shown in this mathematical derivation.

Autocorrelation

The general expression for the autocorrelation function for a lag of samples is

, [S1]

where is the variance of all movement endpoints, x(t) is the movement endpoint at trial t, and x(t+τ) is the movement endpoint at the τth trial following trial t (lag τ). In discrete time, the time index is expressed in samples: , where is the sampling period, and the first lag is

. [S2]

Since , we arrive at

, [S3]

where µx is the mean of all movement endpoints.

Linear Regression

The general expression for the linear regression is where *X* is used to predict *Y*. The regression analysis provides the slope *a* and the y-intercept *b.* This is usually solved using a mean-square error criterion. With this criterion, the solution may be expressed probabilistically as

[S4]

where is the expected value of *Y* given *X.* The parameter of interest is *a* which is the regression slope. The mean square error solution for *a* is

[S5]

Here, and so that

[S6]

The product of the error means approaches zero for steady-state data, so we simplify *Kr* as

[S7]

which further simplifies to:

[S8]

Autocorrelation and linear regression comparison

Comparing Eq. S3 with Eq. S8, we see that the expressions for ACR(1) and *Kr* for steady-state data differ only by a shift. We can summarize this relationship as

. [S9]