



# Corrigendum: Repeated Measures Correlation

Jonathan Z. Bakdash<sup>1\*</sup> and Laura R. Marusich<sup>2</sup>

<sup>1</sup> US Army Research Laboratory, Human Research and Engineering Directorate, Aberdeen Proving Ground, United States,

<sup>2</sup> US Army Laboratory South Field Element, Human Research and Engineering Directorate, University of Texas Arlington, Arlington, TX, United States

**Keywords:** correlation, repeated measures, individual differences, intra-individual, statistical power, multilevel modeling

## A Corrigendum on

### Repeated Measures Correlation

by Bakdash, J. Z., and Marusich, L. R. (2017). *Front. Psychol.* 8:456. doi: 10.3389/fpsyg.2017.00456

In the original article, there were errors in Equations 2 and 3<sup>1</sup>. For Equations 2 and 3,  $j$  should be the participant and  $i$  the trial/repeated measure ( $i$  and  $j$  are swapped for consistency with Equation 1). In Equation 2,  $\overline{Measure2}_i$  should be  $\overline{Measure1}_j$ . Additionally, the notation using  $c$  is confusing in Equation 2 and incorrect in Equation 3. Last, the left side of Equation 3 is incorrect, it should be the predicted value not its mean.

Corrections have been made to the **Background** section, subsection **Rmcorr and ANCOVA, Equations and rmcorr Table**, paragraphs four and five:

In Equations 2 and 3, Equation 1 is rewritten for rmcorr to show one measure as a function of its mean value, participant, and the covaried value of the other measure. Note following Equation 1,  $i$  and  $j$  are now exchanged for consistency:  $j$  = participant and  $i$  = trial or repeated measure.

## OPEN ACCESS

### Edited and reviewed by:

Prathiba Natesan,  
University of North Texas,  
United States

### \*Correspondence:

Jonathan Z. Bakdash  
jonathan.z.bakdash.civ@mail.mil

### Specialty section:

This article was submitted to  
Quantitative Psychology and  
Measurement,  
a section of the journal  
*Frontiers in Psychology*

**Received:** 15 April 2019

**Accepted:** 07 May 2019

**Published:** 28 May 2019

### Citation:

Bakdash JZ and Marusich LR (2019)  
Corrigendum: Repeated Measures  
Correlation. *Front. Psychol.* 10:1201.  
doi: 10.3389/fpsyg.2019.01201

$$Measure1_{ij} = \overline{Measure1}_j + Participant_j + \beta (Measure2_{ij} - \overline{Measure2}_j) + \varepsilon_{ij} \quad (2)$$

$Measure1$  and  $Measure2$  are exchangeable.

$Measure1_{ij}$  is the value of  $Measure1$  for the  $j$ th participant at their  $i$ th trial.

$\overline{Measure1}_j$  is the mean of  $Measure1$  (all  $i$  trials) for the  $j$ th participant.

$Participant_j$  is a unique identifier that acts as a dummy or proxy coded variable.

$\beta$  is the value of the covariate, which is the overall or common slope.

$Measure2_{ij}$  is the value of  $Measure2$  for the  $j$ th participant at their  $i$ th trial.

$\overline{Measure2}_j$  is the mean of  $Measure2$  (all  $i$  trials) for the  $j$ th participant.

$\varepsilon_{ij}$  is the error for the  $j$ th participant at their  $i$ th trial.

Equation 2 is rewritten to calculate the predicted value of the rmcorr regression line for each participant by trial. We drop the error term because we do not fit a confidence interval for the regression line.

$$Measure1'_{ij} = \overline{Measure1}_j + Participant_j + \beta (Measure2_{ij} - \overline{Measure2}_j) \quad (3)$$

$Measure1'_{ij}$  is the predicted y-value of  $Measure1$  for the  $j$ th participant at their  $i$ th trial.

$Measure2_{ij}$  is the actual x-value which corresponds to the predicted y-value in the regression line.

<sup>1</sup>We are grateful to Alexander Wedel for identifying these errors and also thank him for helping correct the equations.

Please note that the **rmcorr package** has always produced the corrected results.

The authors apologize for these errors and state that they do not change the scientific conclusions of the article in any way. The original article has been updated.

*Copyright © 2019 Bakdash and Marusich. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.*