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Ten Misunderstandings about the Two Step Transformation to Normal: A Response to Criticism

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TREO
Technology, Research, Education, Opinion

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A Response to Criticism

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In Templeton and Burney (2017), we demonstrate that a two-step approach successfully transforms variables with even the most extremely auspicious distributions toward normality and changes downstream effect sizes. The *Journal of Information Systems (JIS)* accepted and published a criticism of our work (Rönkkö and Aguirre-Urreta, 2018). Despite its own ongoing policy, *JIS* rejected our response to criticism. This TREO talk is our response to what we view as the ten most glaring misunderstandings in the criticisms posed by Rönkkö and Aguirre-Urreta.

First, we retain our belief that non-normality is a substantial problem in AIS and other IS research. Second, we maintain that it is acceptable and justifiable to transform data, acknowledge that simulated data has its own limitations that should be considered when it is used, argue that transformations do not cause measurement bias when interpreted properly and note that deviations from normality do not "cause" non-normality. Rather, the true causes we identified are characteristics of distributions both before and after transformation. Third, we assert that Rönkkö and Aguirre-Urreta (2018) make important misinterpretations about their primary source, Wooldridge (2009). Fourth, we point out that to make their conclusions, the authors ignore the proper relationship between univariate and multivariate normality. Fifth, we note that back transforming is problematic conceptually and is an issue not only with the two-step, but every transformation procedure. Sixth, we acknowledge that linear regression is always interpreted in the same way (i.e., changes in x relate to the same units of changes in y) regardless of the use of quadratic or polynomial terms. Seventh, the single sample anecdotes used by the authors greatly limit generalizability and do not contradict our results. Eighth, since the criticizing authors do not compare the two-step to any other transformation, they cannot judge its relative merits. Ninth, their discussion about the bias caused by transformation is inappropriate since the authors ignore that models containing transformations should be considered distinct and comparable to their counterparts using original distributions. Tenth, we identify several important ways that the authors mischaracterized our study and the two-step procedure.

References

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