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STATISTICAL DEVELOPMENTS AND APPLICATIONS

The Statistical Developments and Applications Reference List

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Meijer, Streiner, Furr, and Sass (2014) recently provided a brief update on the Statistical Developments and Applications (SDA) section of the journal. This article outlined several ways in which we, the editors of the SDA section, hope to advance the section's goals of keeping readers informed about emerging statistical and psychometric procedures. At that time, we noted that we were preparing a reference list of guidelines for implementing and applying techniques frequently used in personality assessment. More specifically, this

list presents references that provide new and useful insights about both popular and newly developed statistical procedures and that illustrate important procedures that could be applied to the study and practice of personality assessment.

That reference list is now available (see Table 1 or http://personality.org/publications/resources-for-research/) and is intended to improve the quality of research published in *Journal of Personality Assessment (JPA)* and of research more broadly. This list also complements the important statistical

Table 1.—A reference list for contemporary methods of research in personality assessment.

Missing data

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Muthén, B., Kaplan, D., & Hollis, M. (1987). On structural equation modeling with data that are not missing completely at random. *Psychometrika*, 52, 431–462.

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Abraham, W. T., & Russell, D. W. (2008). Statistical power analysis in psychological research. *Social and Personality Psychology Compass*, 2, 283–301. Cicchetti, D. V. (1999). Sample size requirements for increasing the precision of reliability estimates: Problems and proposed solutions. *Journal of Clinical and Experimental Neuropsychology*, 21, 567–570.

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Muthén, L. K., & Muthén, B. O. (2002). How to use a Monte Carlo study to decide on sample size and determine power. *Structural Equation Modeling*, 9, 599–620.

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Kelley, K., & Preacher, K. J. (2012). On effect size. Psychological Methods, 17, 137-152.

Practical meta-analysis effect size calculator: http://cebcp.org/practical-meta-analysis-effect-size-calculator/ (Wilson, D. B., n.d.)

Basic effect size guide with SPSS and SAS syntax: http://www.tandf.co.uk/journals/authors/hjpa/resources/basiceffectsizeguide.rtf (Meyer, G. J., McGrath, R. E., & Rosenthal, R., 2003).

Definitional formulae for effect sizes and their links to inferential statistics: http://psych.wfu.edu/furr/EffectSizeFormulas.pdf (Furr, R. M., 2008)

(Continued on next page)

Table 1.—A reference list for contemporary methods of research in personality assessment. (Continued)

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Wainer, H. (1997). Improving tabular displays, with NAEP tables as examples and inspirations. Journal of Educational and Behavioral Statistics, 22, 1-30.

Wilkinson, L., & Task Force on Statistical Inference. (1999). Statistical methods in psychology journals: Guidelines and explanations. *American Psychologist*, 54, 594–604.

Yu, C. H. (2003). Resampling methods: Concepts, applications, and justification. *Practical Assessment, Research & Evaluation*, 8, 19. Retrieved from http://PAREonline.net/getvn.asp?v=8&n=19

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Instrument development

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Streiner, D. L., & Norman, G. R. (2014). Health measurement scales: A practical guide to their development and use (5th ed.). Shelton, CT: PMPH USA.

Worthington, R., & Whittaker, T. (2006). Scale development research: A content analysis and recommendations for best practices. *Counseling Psychologist*, 34, 806–838.

Internal consistency reliability

Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. Journal of Applied Psychology, 78, 98-104.

Green, S. B., & Yang, Y. (2009). Commentary on coefficient alpha: A cautionary tale. Psychometrika, 74, 121–135.

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Interrater reliability

Byrt, T., Bishop, J., & Carlin, J. B. (1993). Bias, prevalence and kappa. Journal of Clinical Epidemiology, 46, 423–429.

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Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: Uses in assessing rater reliability. Psychological Bulletin, 86, 420–428.

Reliability generalization

Charter, R. A. (2003). Combining reliability coefficients: Possible application to meta-analysis and reliability generalization. *Psychological Reports*, 93, 643–647

Vacha-Haase, T. (1998). Reliability generalization: Exploring variance in measurement error affecting score reliability across studies. *Educational and Psychological Measurement*, 58, 6–20.

Exploratory factor analysis

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, 4, 272–299.

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Confirmatory factor analysis

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103, 411–423.

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Structural equation modeling (SEM)

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Exploratory structural equation modeling

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Marsh, H. W., Nagengast, B., & Morin, A. J. S. (2013). Measurement invariance of big-five factors over the life span: ESEM tests of gender, age, plasticity, maturity, and La Dolce Vita effects. *Developmental Psychology*, 49, 1194–1218.

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Table 1.—A reference list for contemporary methods of research in personality assessment. (Continued)

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Meredith, W. (1993). Measurement invariance, factor analysis and factorial invariance. Psychometrika, 58, 525-543.

Millsap, R. E., & Yun-Tein, J. (2004). Assessing factorial invariance in ordered-categorical measures. Multivariate Behavioral Research, 39, 479-515.

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Differential item functioning

Stark, S., Chernyshenko, O. S., & Drasgow, F. (2004). Examining the effects of differential item (functioning and differential) test functioning on selection decisions: When are statistically significant effects practically important? *Journal of Applied Psychology*, 89, 497–508.

Stark, S., Chernyshenko, O. S., & Drasgow, F. (2006). Detecting differential item functioning with CFA and IRT: Toward a unified strategy. *Journal of Applied Psychology*, 91, 1292–1306.

Walker, C. M. (2011). What's the DIF? Why differential item functioning analyses are an important part of instrument development and validation. *Journal of Psychoeducational Assessment*, 29, 364–376.

Zumbo, B. D. (2007). Three generations of DIF analyses: Considering where it has been, where it is now, and where it is going. *Language Assessment Quarterly*, 4, 223–233.

Mediation and moderation

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182.

Frazier, P. A., Tix, A. P., & Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of Counseling Psychology*, 51, 115–134.

James, L. R., Mulaik, S. A., & Brett, J. M. (2006). A tale of two methods. Organizational Research Methods, 9, 233-244.

Klein, A. G., & Muthén, B. O. (2007). Quasi-maximum likelihood estimation of structural equation models with multiple interaction and quadratic effects. *Multivariate Behavioral Research*, 42, 647–673.

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Preacher, K. J. (in press). Advances in mediation analysis: A survey and synthesis of new developments. Annual Review of Psychology.

Common method variance

Meade, A. W., Watson, A. M., & Kroustalis, C. M. (2007, April). Assessing common methods bias in organizational research. Paper presented at the 22nd annual meeting of the Society for Industrial and Organizational Psychology, New York, NY.

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 65, 539–569.

Richardson, H. A., Simmering, M. J., & Sturman, M. C. (2009). A tale of three perspectives: Examining post hoc statistical techniques for detection and correction of common method variance. *Organizational Research Methods*, 12, 762–800.

Spector, P. E. (2006). Method variance in organizational research: Truth or urban legend? Organizational Research Methods, 9, 221–232.

and psychometric papers that have been published in the SDA section since 2003 (see Table 1 in Meijer et al., 2014).

We see this evolving list, along with the previous SDA section papers, as being useful for several purposes. First, authors who are preparing manuscripts for *JPA* will hopefully find the articles useful for informing and shaping their analytic strategies, at the same time improving the quality of their research. Second, *JPA* reviewers might find the list useful when gauging the strengths and weaknesses of a paper's analytic strategies and conclusions. Third, *JPA* readers might find the list useful when seeking greater depth in contemporary methods of studying personality assessment. Fourth, instructors seeking resources for training students in personality assessment could use the list to help shape a set of course readings. Finally, we hope that consumers and producers of personality assessment research more generally will benefit from having a wide-ranging set of key technical readings in psychometric and statistics.

The list is not meant to be comprehensive, but rather to highlight some useful educational sources in psychometrics and statistics. In addition, we imagine adding new topics to the list, along with updated citations within the various topics. We hope that *JPA* readers will participate in this evolution, thus we invite suggestions for revisions. Please feel free to contact us at FurrRM@wfu.edu (R. Michael Furr), daniel.sass@utsa.edu (Daniel A. Sass), streiner@mcmaster.ca (David L. Streiner), or r.r.meijer@rug.nl (Rob R. Meijer).

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