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Exploratory Factor Analysis With Small Sample Sizes

J. C. F. de Winter*, D. Dodou* & P. A. Wieringa

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Abstract

Exploratory factor analysis (EFA) is generally regarded as a technique for large sample sizes (N) a comprehensive ity results for N be ired N for different es (p) and to examine small distort , unequal loadi congruence coefficie ween eigenval ataset of individua d that when data are esults for N

well below 50, even in the presence of small distortions. Such conditions may be uncommon but should certainly not be ruled out in behavioral research data.

* These authors contributed equally to this work

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Notes

* These authors contributed equally to this work

[1] This article defines simple structure as a special case of Thurstonian simple structure, also called independent cluster structure or ideal simple structure.

[2] Lorenzo-Seva and Ten Berge (2006) suggest the .95 threshold for good agreement on the basis of judgments of factor similarity by factor analytic experts. Note that others have used a .92 threshold for good and .98 for excellent agreement (MacCallum et al., 2001).

[3] The ES reduced correlati it is more concept trix (RCM, with c e number of comi ave repeated the subs ates based on squa based on the UCM at overall average

[a] A different population pattern was produced for each repetition for all conditions of groups 3, 4, and 11.

[b] The numbers refer to the variables per factor with a .8 loading.

[4] A loading of .6 was considered low for the sample size (N = 17) under investigation. This was based on the findings of the first part of the simulations (Table 2): for λ = .6, f = 3, p = 24, the required minimum N for good agreement (K = .95) was 55.

[5] Cronbach's α was calculated for two conditions of the first simulation series (low loadings: λ = .2, f = 2, p = 24, N = 1,438 and high loadings: λ = .9, f = 2, p = 24, N = 6), Although factor recovery was identical in those two conditions (see Table 2), average Cronbach's a among variables loading on the factor was .332 for the low loadings and .968 for the high loadings. This demonstrates that high internal consistency is not necessary for good factor recovery. A more detailed discussion of this issue can be found in Boyle (1991).