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| Table S1. Root mean square error (RMSE) values for converged replications, averaged by parameter type for each model and estimator | | | | | | |
|  |  | Parameter | True Correlation | | | |
| Estimator | Model | Type | 0 | .1 | .3 | .5 |
| ML | Obliq | *λ* | 338.57 | 112.29 | 65.75 | 45.30 |
|  |  | *ν* | 399.59 | 119.38 | 71.93 | 45.67 |
|  |  | *ψ*AB | 0.38 | 0.35 | 0.35 | 0.33 |
|  | Ortho | *λ* | 366.14 | 259.53 | 60.74 | 60.58 |
|  |  | *ν* | 547.18 | 254.99 | 65.39 | 80.31 |
|  |  | *ψ*AB | 0.00 | 0.10 | 0.30 | 0.50 |
| Bayes SD = 1 | Obliq | *λ* | 0.48 | 0.48 | 0.47 | 0.45 |
|  |  | *ν* | 0.38 | 0.39 | 0.38 | 0.38 |
|  |  | *ψ*AB | 0.27 | 0.26 | 0.27 | 0.27 |
|  | Ortho | *λ* | 0.44 | 0.44 | 0.45 | 0.44 |
|  |  | *ν* | 0.38 | 0.39 | 0.38 | 0.39 |
|  |  | *ψ*AB | 0.00 | 0.10 | 0.30 | 0.50 |
| Bayes SD = 3.5 | Obliq | *λ* | 0.55 | 0.56 | 0.55 | 0.55 |
|  |  | *ν* | 0.52 | 0.53 | 0.52 | 0.54 |
|  |  | *ψ*AB | 0.29 | 0.28 | 0.30 | 0.31 |
|  | Ortho | *λ* | 0.57 | 0.57 | 0.58 | 0.57 |
|  |  | *ν* | 0.50 | 0.50 | 0.50 | 0.49 |
|  |  | *ψ*AB | 0.00 | 0.10 | 0.30 | 0.50 |
| Bayes SD=5 | Obliq | *λ* | 0.71 | 0.72 | 0.72 | 0.72 |
|  |  | *ν* | 0.69 | 0.71 | 0.71 | 0.73 |
|  |  | *ψ*AB | 0.28 | 0.28 | 0.30 | 0.32 |
|  | Ortho | *λ* | 0.72 | 0.73 | 0.72 | 0.71 |
|  |  | *ν* | 0.64 | 0.65 | 0.64 | 0.62 |
|  |  | *ψ*AB | 0.00 | 0.10 | 0.30 | 0.50 |
| RMSE quantified both sampling variability and squared bias. When an estimator is unbiased, RMSE gives an empirical standard error; if bias is present RMSE is a measure of overall accuracy. Note that RMSE values reflect averages across different numbers of converged replications in each condition, see Table 2. The values for thresholds and loadings using ML are massive and clearly influenced by “extreme” estimates (which occurred frequently). | | | | | | |

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| Table S2. Median absolute deviation about the median (MAD) values for converged replications | | | | | | |
|  |  | Parameter | True Correlation | | | |
| Estimator | Model | Type | 0 | .1 | .3 | .5 |
| ML | Obliq | *λ* | 0.58 | 0.59 | 0.54 | 0.55 |
|  |  | *ν* | 0.42 | 0.46 | 0.39 | 0.42 |
|  |  | *ψ*AB | 0.26 | 0.24 | 0.22 | 0.20 |
|  | Ortho | *λ* | 0.50 | 0.54 | 0.51 | 0.50 |
|  |  | *ν* | 0.40 | 0.41 | 0.37 | 0.38 |
|  |  | *ψ*AB | 0.00 | 0.00 | 0.00 | 0.00 |
| Bayes SD = 1 | Obliq | *λ* | 0.12 | 0.13 | 0.13 | 0.14 |
|  |  | *ν* | 0.14 | 0.15 | 0.13 | 0.14 |
|  |  | *ψ*AB | 0.19 | 0.18 | 0.17 | 0.16 |
|  | Ortho | *λ* | 0.13 | 0.13 | 0.13 | 0.12 |
|  |  | *ν* | 0.14 | 0.15 | 0.13 | 0.14 |
|  |  | *ψ*AB | 0.00 | 0.00 | 0.00 | 0.00 |
| Bayes SD = 3.5 | Obliq | *λ* | 0.34 | 0.35 | 0.35 | 0.35 |
|  |  | *ν* | 0.29 | 0.30 | 0.28 | 0.31 |
|  |  | *ψ*AB | 0.21 | 0.20 | 0.19 | 0.18 |
|  | Ortho | *λ* | 0.36 | 0.37 | 0.37 | 0.36 |
|  |  | *ν* | 0.29 | 0.28 | 0.27 | 0.27 |
|  |  | *ψ*AB | 0.00 | 0.00 | 0.00 | 0.00 |
| Bayes SD=5 | Obliq | *λ* | 0.40 | 0.40 | 0.40 | 0.41 |
|  |  | *ν* | 0.33 | 0.35 | 0.33 | 0.36 |
|  |  | *ψ*AB | 0.20 | 0.20 | 0.18 | 0.18 |
|  | Ortho | *λ* | 0.42 | 0.43 | 0.43 | 0.41 |
|  |  | *ν* | 0.34 | 0.33 | 0.32 | 0.31 |
|  |  | *ψ*AB | 0.00 | 0.00 | 0.00 | 0.00 |
| Because the RMSE values for ML estimates are so extreme (see table S1, above), the MAD is also a useful comparison. Note that MAD values reflect averages across different numbers of converged replications in each condition, see Table 2. | | | | | | |





Figure S1. Median ML and Bayesian (posterior median) threshold estimates and 95% quantiles for converged replications in correlated (top) and uncorrelated models (bottom) where true factor correlation = .5. Note: True estimates are indicated by triangles. Axes are truncated for comparison; the intervals for ML estimates were too wide to plot. R is the number of converged replications in each condition.